PROGRAM OF ANNUAL MEETINGS

of
The Maryland Vegetable Growers' Association
Lord Baltimore Hotel,
Baltimore, Maryland.

FIRST SESSION

Wednesday, January 9, 1935.

9:30 A.M. — Call to Order, - - - - - - - - - - President W. N. Eyler.

9:35 A.M. — Best Varieties of Vegetables for Maryland Conditions, - - - - - Wm. A. Frazier, University of Maryland.

10:30 A.M. — Recent Developments in Truck Crop Research, - - - - - - - V. R. Boswell, U. S. Department of Agriculture.

11:15 A.M. — Culture and Handling of Sweet Potatoes, - - - - - - - - - W. P. Hotton, Salisbury, Maryland.

Appointment of Committees.

SECOND SESSION

Thursday, January 10, 1935.

9:30 A.M. — Color and Other Factors Influencing Quality in Tomatoes, - - H. B. Cordner, University of Maryland. 10:10 A.M.

10:25 A.M. — Controlling Truck Crop Insects and Avoiding Spray Residue, - - D. J. Caffrey, U.S.Department of Agriculture. 10:50 A.M.

11:10 A.M. — Price Trends and Outlook for Market Vegetables, - - - - - - - Gustave Burmeister, U.S.Department of Agriculture. 11:35 A.M.

Report of Committees.

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Join the Maryland Vegetable Growers' Association and receive the monthly News Letter and the Annual Report.

Name .....

Address .....

Dues $1.00 per year, payable in advance. Send to W. R. Ballard, Secretary-Treasurer, College Park, Maryland.

Officers for 1935.

Richard T Merritt Pd.
Joshua Lynch Pd
J Richard Fitzell Bd.
Geo. Elmer Koppelman Pd.

Sale Potato Exhibits to Mrs Connolly 1.00

F.R Todd for Auditing Com reported books were in order
Report accepted,

Table I – Results of Variety Trial of Sweet Corn

(Weaver Farm – 1934.)

Data Based on Plots 1/100 acre Planted in hills 3' x 4'	Hop Cross: Ban- tam	Golden Cross Ban- tam	Sto- wells: Hybrid: 14x5	Sto- wells Ever- green	Coun- try Gentle- man	Count. Gentle. man Hybrid 9x19	Narrow Grain Ever. Hybrid 26x15	Narrow Grain Ever- green	Differ- ence Require- ed*
A. Total Yield									
1. Number of ears per plot	106.5	113.0	100.0	101.5	110.3	121.0	110.8	115.8	15.21
2. Number pds. of ears per plot	39.4	46.5	60.6	69.0	56.4	50.8	68.8	61.8	6.49
B. Marketable Yield (culls excluded)									
1. Pounds of ears per plot **	22.0	24.0	36.3	39.0	31.3	24.8	41.3	30.8	6.30
2. Number of ears per plot	66.3	61.8	83.3	80.0	61.5	52.3	89.5	58.0	
C. U.S. Grades as % of Total Weight									
1. Per cent grade #1	56.2	57.6	66.6	64.6	64.2	59.6	78.1	55.7	6.60
2. Per cent grade #2	21.6	14.3	17.9	18.4	14.2	12.9	8.0	18.1	
3. Per cent grade #3	22.2	28.1	15.5	17.0	21.6	27.5	13.9	26.2	
D. Time of Maturity									
1. Days – planting to harvest	76	79	86	88	88	88	88	91	
2. Days – planting to 50% silked	55.5	58.5	64.0	66.5	68.5	66.0	65.5	68.5	
3. Days – 25% to 75% of ears silked	5.2	3.8	5.0	6.0	5.5	5.8	5.8	4.3	

* – Required for differences to be significant according to Fisher's Method of Analysis of Variance.

** – Pounds of husked ears.

Table II – Various Defects Causing Ears to be Classed as Grade #2 and #3.

(Expressed as per cent of the total number of defective ears).

Defects Tabulated	Top Cross Bantam	Golden Cross Bantam	Stowell Evergreen Hybrid 14x5	Stowells Evergreen	Country Gentleman	Country Gentleman H. 9x19	Narrow Grain Hybrid 26x15	Narrow Grain Evergreen
1. Worm injury	27.7	19.1	12.7	8.1	9.8	7.2	5.0	4.5
2. Imperfect pollenation	10.6	9.2	19.0	16.2	20.3	14.2	14.0	24.7
3. Worm & pollenation	8.1	–	0.5	–	–	–	–	–
4. Smut	0.4	–	–	0.9	3.1	1.0	0.5	1.7
5. Soured (rain injury)	–	6.4	–	0.9	0.4	–	1.5	–
6. Length (short nubbins)	–	1.2	–	6.0	4.3	2.6	3.5	1.7
7. Immature-undeveloped	53.2	63.4	65.9	68.2	62.1	75.1	75.5	64.5

Table III – Canning Data Secured in Variety Trial of Sweet Corn – 1934.

Data Secured Expressed as % of Total Weight.	Top Cross Bantam	Golden Cross Bantam	Stowell Ever-green Hybrid	Stowells Ever-green	Country Gentleman	Country Gentleman Hybrid	Narrow Grain Hybrid	Narrow Grain Ever-green
A. Corn as Harvested								
1. Percentage of cut corn	28.1	25.9	23.3	20.4	23.6	24.7	22.6	20.3
2. Percentage of husks	20.7	27.6	29.8	29.8	29.3	30.0	27.9	26.2
3. Percentage cobs and trimmings	51.2	46.5	46.9	49.8	47.1	45.3	39.5	53.5
B. Grade #1.								
1. Percentage of cut corn	37.2	33.5	29.2	30.8	33.5	33.9	29.8	31.9
2. Percentage of husks	34.8	32.7	31.5	32.6	30.6	31.1	32.8	33.6
3. Percentage of cobs	22.8	29.4	33.3	31.9	30.2	29.3	33.2	30.1
4. Percentage of trimmings	5.2	4.4	6.0	4.7	5.7	5.8	4.4	4.4
C. Grade #2.								
1. Percentage of cut corn	23.0	30.4	20.7	22.4	26.5	27.6	20.7	23.0
2. Percentage of husks	34.8	39.1	36.5	35.0	34.9	31.9	37.7	36.0
3. Percentage of cobs	24.7	27.3	37.0	35.8	32.1	34.0	37.8	37.4
4. Percentage of trimmings	17.5	33	5.8	6.8	6.5	6.5	3.9	3.6
D. Yield of Cut Corn								
1. Pounds of cut corn per acre	1228.	1758.	1447.	1483.	1447.	1394.	1425.	1308
2. Cases of canned corn per acre *	59.6	83.7	68.9	69.7	68.9	66.4	67.9	62.3
TOTAL YIELD – Pounds per acre	3870	5295	5254	5344	4651	4264	5335	4550

* – Calculated on the basis of 14 oz. per #2 can.

Table IV - Variety Trials of Sweet Corn

(Planted Weaver Farm - June 2, 1934)

Yield Data - Plant Basis	Top Cross Bantam	Golden Cross Bantam	Stowell Ever. green Hybrid 14x5	Stowells Evergreen	Country Gentleman	Country Gentle. Hybrid 9x19	Narrow Grain Hybrid 26x15	Narrow Grain Evergreen
Total number of ears	1.63	1.74	1.50	1.57	1.69	1.94	1.65	1.77
Number of marketable ears	1.01	0.96	0.95	0.93	0.93	0.84	1.33	0.88
Weight of marketable ears (in husk)	0.47	0.52	0.72	0.89	0.68	0.59	0.88	0.70
Weight of marketable ears (husked)	0.34	0.37	0.54	0.60	0.47	0.40	0.61	0.48

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VEGETABLE GROWERS NEWS LETTER

Issued by
The Maryland Vegetable Growers Association
W. R. Ballard, Secretary-Treasurer.

Vol. XII. No. 1. College Park, Maryland January, 1935

The Annual Meeting. The papers and discussions at the two morning sessions of the Association proved to be of considerable interest and an effort will be made to get separates of them for distribution to the members when the Proceedings are published.

The Treasurer reported a balance in the bank as of December 31, 1934 of $29.48, with all bills paid. The report of the auditing committee approving the Treasurer's report was adopted. For the benefit of new members, it may be stated that the Association pays to the Maryland Farm Bureau Federation annual dues amounting to $20.00.

The officers elected for 1935 are as follows:

President, W. N. Eyler, Flintstone,
Vice-President, W. P. Hotton, Salisbury,
Directors: F. R. Todd,
Elmer Koppelman,
J. Richard Fitzell,
Director to Farm Bureau, Joshua Lynch,
Delegate to Farm Bureau, R. T. Merritt,
Director to Agricultural Corporation, W. G. Lynch,
Secretary-Treasurer, W. R. Ballard,

The following resolutions were adopted by the Association:

WHEREAS, the Maryland Vegetable Growers Association has enjoyed an unusually good program during this annual meeting, and

WHEREAS, it is felt that many vegetable growers could profit by attending these meetings, and the Association would benefit by a larger membership; therefore be it

RESOLVED that the Association expresses its sincere appreciation to all of the speakers who made this program possible, and be it

RESOLVED, that the Association express its gratitude to its Secretary, Mr. W. R. Ballard, for his efforts in arranging the program, for his continued interest in the success of the Association, and for the preparation and issuance of the Monthly News Letter, and be it further

RESOLVED that a continued and increased effort be made to build up the membership and the attendance at the annual meetings.

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Yield From Eastern Shore Home Grown Irish Cobbler Potato Seed Increased By Raising Storage Temperature. Eastern Shore potato growers have been using home grown seed for the production of a portion of their early crop for the past thirty years.

Experiments conducted in Maryland and Virginia for the past fifteen years have shown that northern grown Irish Cobbler potato seed came up and matured about one week to ten days sooner and yielded slightly more than home grown seed. However, home grown seed is more desirable than northern grown seed because of its smaller size and freedom from certain diseases such as Blackleg. In 1933 and 1934 home grown Eastern Shore Irish Cobbler potato seed was compared with northern grown seed in the western part of the state at elevation of 1000 to 3000 feet where the planting time is six to eight weeks later than it is on the Eastern Shore. In such localities the home grown Eastern Shore seed came up and matured as soon as the northern grown seed and yielded just as well.

Seed potatoes will not come up if they are planted immediately after they are dug, but they must pass through a certain rest period before they will sprout. This rest period varies with different varieties and the Irish Cobbler potato has a very long rest period. The length of the storage period is affected by the storage temperature and other storage conditions. Home grown seed is dug later than northern grown seed and is usually less mature than northern grown seed when it is dug. Thus the reason why Eastern Shore home grown yield less than northern grown seed when planted on the Eastern Shore is because it is planted so early there that it is not fully over its dormant period, whereas northern grown seed is fully over its dormant period when planted at that time.

In 1934 northern grown seed was compared with home grown Eastern Shore seed kept at ordinary storage temperature (approximately 40°F.) during the entire storage period with home grown Eastern Shore seed kept at ordinary storage temperatures until January 15, and then kept at a storage temperature of approximately 65°F. until planted, and with home grown Eastern Shore seed kept at ordinary storage temperature until February 14, and then kept at a storage temperature of approximately 65°F. until planted. As a result of these comparisons which were made on the early crop on the Eastern Shore, the largest yield of primes (245 bu. per acre) was obtained from the home grown Eastern Shore seed kept at approximately 65°F. after January 15; the next largest yield of primes (227 bu. per acre) was obtained from North Dakota seed; the third largest yield of primes (219 bu. per acre) from home grown Eastern Shore seed kept at approximately 65°F. after February 14, and the smallest yield of primes (215 bu. per acre) was obtained from home grown Eastern Shore seed kept at ordinary storage temperatures during the entire storage period.

Further tests will be necessary before it can be postively determined whether it will be profitable to raise the storage temperature of home grown Eastern Shore Cobbler potato seed during the latter part of the storage period, but last year's results were so promising that Eastern Shore potato growers are advised to bring in a few bushels of their home grown seed between January 15 and February 15 and compare the yields obtained from seed treated in this manner with yields from home grown seed kept at ordinary storage temperatures.

STATE POTATO SHOW SUCCESS

A very successful potato show was held at the Lord Baltimore Hotel, January 9 and 10, 1935. The show was sponsored by the Maryland Farm Bureau Federation and the Maryland Vegetable Growers Association. There were nine

exhibits of sweet potatoes and nineteen exhibits of white potatoes. The show was judged by T. H. White of the Horticultural Department of the Maryland Experiment Station. The following prizes were won:

Sweet Potatoes

Class Adult Commercial:
First - Carl H. Smith, Salisbury on Maryland Golden Sweet.
Second - Carl H. Smith, Salisbury on Bigstem Jersey.

Class Adult Certified:
First - W. P. Hotton, Salisbury on Maryland Golden Sweet.
Second - Howard Hanberry, Wetipkin on Bigstem Jersey.
Third - E. W. Townsend, Salisbury on Maryland Golden Sweet.

White Potatoes:

Class Adult Commercial:
First - Hubert Friend, Hoyes, Maryland on Smooth Rural.

Class Adult Certified Cobbler:
First - W. A. Ward, Pocomoke.

Class Adult Certified Rural:
First - Howard Schlossnagle, Accident, Maryland on Smooth Rural.
Second - Ray Gearg, Grantsville, Maryland on Russet Rural.

Class Adult Certified, Any Other Variety:
First - Laurence Gilardi, Boonsboro, Md. on Katahdin.
Second - Wm. Cissel Simpson, Clarksville on Dakota Red.
Third - Samuel Hearn, Laurel, Maryland on Dakota Red.

Class Junior Commercial Rural or Dakota Red:
First - Albert Richter, Accident, Maryland on Russet Rural.
Second - Clark Schlossnagle, Accident, Maryland on Smooth Rural.
Third - Robert A. Shoemaker, Woodbine, on Dakota Red.

Class Junior Commercial, Any Other Variety:
First - Roosevelt Gilardi, Boonsboro, Maryland on Irish Cobbler.
Second - Harry Porter, Jr., Oakland, Md. on Katahdin.
Third - Robert A. Shoemaker, Woodbine, Maryland on Irish Cobbler.

Class Junior Certified Rural or Dakota Red:
First - Paul Miller, Accident, Maryland on Smooth Rural.
Second - Clark Schlossnagle, Accident, Maryland on Smooth Rural.
Third - John R. Jehle, Hyattsville, Maryland on Dakota Red.

Class Junior Certified, Any Other Variety:
First - John R. Jehle, Hyattsville, Maryland on McCormick.
Second - Harry Porter, Jr., Oakland, Maryland, on Chippawa.
Third - Robert Underwood, Anacostia, D. C. R. R. #4 on McCormick.

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Vol. XII. No. 2. College Park, Maryland. February, 1935

Head Lettuce. Wisconsin Horticulture says, "Thompson and Knott of Cornell University have found that head lettuce will make no heads at all where a temperature from 70 to 80 degrees is maintained. Sixty to 70 degrees is most favorable for head formation. This, together with the fact that long days tend to cause lettuce to run to seed, explains why it is difficult to raise good head lettuce when the plants strike a hot spell in June before the heads are formed."

Under Maryland conditions early maturing varieties such as May King are more satisfactory than larger varieties such as Big Boston. It was reported at the annual meetings in Baltimore that work being conducted by the U. S. Department of Agriculture shows considerable promise in the development of types better adapted to heading under warm conditions than those on the market. It will be some time, however, before seed of these new sorts will be available commercially.

Damping Off. "Zinc plus copper for damping-off," says Geneva Station, New York, "gives almost perfect control. Red Copper Oxide for treating the seed and Zinc Oxide as a coating over the top soil has been tried and it explained by J. G. Horsfall, Plant Specialist, in a new bulletin. The zinc oxide 'galvanizes' the soil, he says."

When Should Asparagus be Cut? The Illinois Experiment Station has recently issued a report on the effect of light and heavy cutting of newly established asparagus plantations (Bulletin 401). Records were secured over a seven year period. Plot 1 was not cut until the third season; plot 4 was cut lightly the second year; plot 2 was cut heavily the second year, and plots 5, 3, and 6 were cut light, medium, and heavy beginning the first year. Records of both the number of spears, total weight, and percent of grades No. 1, No. 2, and strings were determined.

Results show conclusively that early heavy cutting affected adversely and permanently the plots subjected to such treatment. It appeared that the best practice to follow was to cut lightly in the second year, but in every year not to extend the cutting season unduly. If maximum yield and quality are to be maintained, plants should be allowed a full growing season in order to build up the crowns for the next spring's cutting.

It is probable that heavy fertilizing would play some part in the results. In the experiment reported upon all plots received 500 pounds of a 4-8-4 at the end of the cutting season.

Canners' and Field Men's Conference. Some of the members may be interested in the two days Conference which was held at the Horticultural Building, College Park on February 26th and 27th. The first session was devoted to soil and fertilizer problems. Grades, new varieties and strains, factors affecting canning quality and similar phases of the tomato industry were given attention the first afternoon and the second morning. The Corn ear worm and the vinegar gnat were discussed. On the second afternoon breeding, development and testing of hybrid sweet corns and variety tests and new developments in peas, were discussed.

The Annual Report. The papers and other items of interest presented at the annual meeting in Baltimore last January have been turned over to Dr. T. B. Symons for printing in the Annual Report. The Secretary has requested that separates be furnished for all paid up members and he has been assured that a sufficient supply will be available. If you have not sent in your dues for 1935, be sure to do so in order that the report may reach you without undue delay.

How About Repairs? Before the rush of spring work comes on apace, any needed repairs to machinery should be made. Overhaul all tools and equipment now when work in the field is at a standstill. A little forethought may help to avoid delays in the busy season. Spray apparatus should be put in shape and the needed spray materials secured. The successful use of Rotenone products in the control of certain insect pests as outlined by Dr. Caffrey at the annual meetings should interest growers and if this material is new to them, its use should be learned in advance. Apparently rotenone does not kill as quickly as some other materials so that more time must be allowed before deciding that the spray is not effective.

How About Manganese? Recent work has shown that manganese is a very important constituent of soils where good growth is wanted. While no experimental work has been done in the use of this element on Maryland soils, tests show many soils to be deficient in manganese. It would perhaps be worthwhile for growers to try out in a small way the use of this material. Of course the proper method is to have the soil tested to determine the deficiency, if any, and the amount of manganese which should be added.

It is understood that this is one of the ingredients in Vigoro and may explain in part the good results attending its use.

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Vol. XII. No. 3. College Park, Maryland. March, 1935

Sweet Corn Trials. R. G. Rothgeb of the Department of Agronomy has just issued a special report on field trials of sweet corn at College Park. This material was presented before the Canners' and Field Men's School, which met recently at the University of Maryland.

The following quotation from this report may be of interest to Association members:

1. Many hybrids which do well in other parts of the country are not adapted to Maryland. It is just as necessary, if not more so, to test hybrids as it is varieties.

2. Golden Cross Bantam has done well for four years, and is to be recommended where it is desired to grow a yeallow corn of excellent canning quality with short fodder and maturing a week to ten days earlier than Evergreen. In yield of marketable ears it has compared favorably with Evergreen, and has far surpassed 8-row Golden Bantam.

3. In these trials an Evergreen hybrid (Asgrow 14.5) has outyielded open pollinated Evergreen from Connecticut, but has not equalled a home grown strain of Evergreen. In uniformity and ear quality the hybrid has been superior.

4. Several Narrow Grain Evergreen hybrids have shown up well. Purdue 503 has been consistently high for three years. However, it has shown a tendency toward divided ear tips and branched ears. Asgrow 26.15 has been tried for two years, and at present seems to be a very promising hybrid for Maryland.

5. No Country Gentleman hybrid has been included which has consistently outyielded good open pollinated stocks. In 1934 a Yellow Country Gentleman hybrid (Asgrow Golden Colonel) performed equally as well as commercial stock.

6. Suncross P39 from the Connecticut Experiment Station is a yellow top cross which outyielded Golden Cross in 1934. Further tests are needed to establish its value.

7. Top crossed Spanish Gold gives promise as a 70 day yellow hybrid.

8. Landreth's Money Maker has been outstanding for sweetness of kernel.

9. Hopeland, a sweet x dent hybrid bred by the Maryland Station, has yielded well but has been somewhat deficient in quality.

Cold Storage of Vegetables. Bulletin 602, STUDIES ON COLD STORAGE OF VEGETABLES, published by Cornell University, Ithaca, New York, gives interesting data on the storage of a score or more of common vegetables. A brief summary is given here, but if any one is particularly interested in the subject he should get and read the bulletin.

Recommended Storage Conditions and Approximate Maximum Storage Period For Vegetables.

Vegetable	Temperature	Relative Humidity	Maximum Storage Period
	Degrees F.	Per cent	
Asparagus,	32	95-98	1 week
Beans, snap,	40	90-98	12 days
Beans, lima,	32	90-95	2-3 weeks
Beets,	32-40	90-95	4-5 months
Broccoli, sprouting,	32	95-98	10 days
Brussels sprouts,	32	95-98	2 months
Cabbage,	32-40	90-98	5 months
Carrots,	32-40	90-95	6 months
Cauliflower,	32	90-98	30-40 days
Celery,	32	90-98	3-5 months
Cucumbers,	32-40	95-98	4-5 weeks
Eggplant,	32	90-95	3-4 weeks
Kale,	32	95-98	1 month
Lettuce,	32	95-98	3-4 weeks
Muskmelons, immature	50	80-90	2 weeks.
Muskmelons, mature	32	80-90	1 month
Onions and onion sets	31-32	80-95	5 months
Parsnips,	32	90-95	5 months
Peas, green,	32	95-98	2 weeks
Peppers,	32	95-98	40 days
Pumpkins,	40	50-70	2-3 months
Rutabagas,	32-40	90-95	3-4 months
Squash,	40	50-70	5 months
Sweet corn,	32	90-98	3-4 weeks
Tomatoes, green ripe,	50-60	95-98	1 month
Tomatoes, ripe,	40	95-98	10 days.

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Vol. XII. No. 4. College Park, Maryland. April, 1935

Controlling the Corn Ear Worm. At the recent Canners' School, Dr. Ditman of the Entomology Department reported on tests being made to control this pest of sweet corn.

In cooperation with the Agronomy Department observations were made on the resistance of varieties to injury by the corn ear worm. The per cent of damage varied from .5 to 11.5 per cent in 1932 and from .3 to 3.6 per cent in 1934. Strains of Country Gentlemen seemed to have about as high a rating as any of the usual varieties grown commercially.

Of considerable interest are the results of tests made in poisoning moths through the use of poison baits.

The baits were applied about the edge of the corn fields every evening after sundown during the silking period. Moths are reported to be attracted in large numbers and to feed greedily on the bait. It is further reported that large numbers of dead moths could be picked up in the field.

Dr. Ditman worked on the selection of the most attractive sugars and the concentration required. Both laboratory and field tests indicated that sucrose (cane sugar) was the most attractive, and attractive at a lower concentration than any other form of sugar.

The next step was to find the poison most suitable and the proper concentration. The following table gives the results of this work.

Insecticide.	Amount of Solution.	Amount of Poison Taken.	Survival Time in Minutes.
Sodium arsenite	.0010 gm	.04	18
Tartar emetic	.0155 gm	.62	620
Thallium sulphate	.055 gm	.20	230
Sodium fluoride	.0180 gm	.18	75
Pyrethrum	.000 gm		

7. Top crossed Spanish Gold gives promise as a 70 day yellow hybrid.

8. Landreth's Money Maker has been outstanding for sweetness of kernel.

9. Hopeland, a sweet x dent hybrid bred by the Maryland Station, has yielded well but has been somewhat deficient in quality.

Cold Storage of Vegetables. Bulletin 602, STUDIES ON COLD STORAGE OF VEGETABLES, published by Cornell University, Ithaca, New York, gives interesting data on the storage of a score or more of common vegetables. A brief summary is given here, but if any one is particularly interested in the subject he should get and read the bulletin.

Recommended Storage Conditions and Approximate Maximum Storage Period For Vegetables.

Vegetable	Temperature	Relative Humidity	Maximum Storage Period
	Degrees F.	Per cent	
Asparagus,	32	95-98	1 week
Beans, snap,	40	90-98	12 days
Beans, lima,	32	90-95	2-3 weeks
Beets,	32-40	90-95	4-5 months
Broccoli, sprouting,	32	95-98	10 days
Brussels sprouts,	32	95-98	2 months
Cabbage,	32-40	90-98	5 months
Carrots,	32-40	90-95	6 months
Cauliflower,	32	90-98	30-40 days
Celery,	32	90-98	3-5 months
Cucumbers,	32-40	95-98	4-5 weeks
Eggplant,	32	90-95	3-4 weeks
Kale,	32	95-98	1 month
Lettuce,	32	95-98	3-4 weeks
Muskmelons, immature	50	80-90	2 weeks.
Muskmelons, mature	32	80-90	1 month
Onions and onion sets	31-32	80-95	5 months
Parsnips,	32	90-95	5 months
Peas, green,	32	95-98	2 weeks
Peppers,	32	95-98	40 days
Pumpkins,	40	50-70	2-3 months
Rutabagas,	32-40	90-95	3-4 months
Squash,	40	50-70	5 months
Sweet corn,	32	90-98	3-4 weeks
Tomatoes, green ripe,	50-60	95-98	1 month
Tomatoes, ripe,	40	95-98	10 days.

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VEGETABLE GROWERS' NEWS LETTER

Issued by
The Maryland Vegetable Growers' Association.
W. R. Ballard, Secretary-Treasurer.

Vol. XII. No. 4. College Park, Maryland. April, 1935

Controlling the Corn Ear Worm. At the recent Canners' School, Dr. Ditman of the Entomology Department reported on tests being made to control this pest of sweet corn.

In cooperation with the Agronomy Department observations were made on the resistance of varieties to injury by the corn ear worm. The per cent of damage varied from .5 to 11.5 per cent in 1932 and from .3 to 3.6 per cent in 1934. Strains of Country Gentlemen seemed to have about as high a rating as any of the usual varieties grown commercially.

Of considerable interest are the results of tests made in poisoning moths through the use of poison baits.

The baits were applied about the edge of the corn fields every evening after sundown during the silking period. Moths are reported to be attracted in large numbers and to feed greedily on the bait. It is further reported that large numbers of dead moths could be picked up in the field.

Dr. Ditman worked on the selection of the most attractive sugars and the concentration required. Both laboratory and field tests indicated that sucrose (cane sugar) was the most attractive, and attractive at a lower concentration than any other form of sugar.

The next step was to find the poison most suitable and the proper concentration. The following table gives the results of this work.

Insecticide.	Amount of Solution.	Amount of Poison Taken.	Survival Time in Minutes.
Sodium arsenite	.0010 gm	.04	18
Tartar emetic	.0155 gm	.62	620
Thallium sulphate	.055 gm	.20	230
Sodium fluoride	.0180 gm	.18	75
Pyrethrum	.000 gm		

Preliminary experiments indicate that there is a pretty good chance of killing moths with poison bait traps. This work is to be continued this season.

Can You Cook Sweet Potatoes? The sweet potato is one of the most important vegetable crops produced in Maryland, ranking about third in value of vegetable crops grown. Circular 97 issued by the Extension Service discusses various methods of preparing this vegetable for the table, both alone and in combination with other materials. The housewife will, perhaps appreciate having the receipts given in the circular which may be had for the asking.

Relief Gardens. Some of the counties frequently get stirred up about providing gardens for those on relief. However investigation many times proves the problem to be much more complicated than appears on the surface. Those who know how to garden can be helped by furnishing seeds, but too often those who need such help the most are just the ones who will not put forth the necessary exertion to have a good garden.

Those without experience make mistakes in the selection of plots, little realizing how difficult it is to produce good vegetables on poor soils. It is difficult to do much with a poor soil in one season and some crops require soils of the highest tilth to give results commensurate with the labor and expense involved.

Community projects are apt to fail for lack of competent supervision.

It appears likely that the commercial vegetable grower will not need to become alarmed at the prospect of competition from this source.

Frost Injury. The season is fast approaching when danger from spring frosts will be over in most parts of Maryland. There is always a critical period when hot beds and cold frames must be carefully watched to avoid damage from sudden changes of weather. Then too, careful attention must be given to properly hardening off plants so that they may go to the field in a condition to stand the rigors of life in the open. Many market gardeners take a chance on setting plants early or planting seeds before the usual time, knowing full well that both may be lost. However if the late frosts are escaped the maturing of the crop a few days earlier may mean a better price for the product.

Some vegetables as Lima beans cannot be advanced much by ordinary methods because the seed so often rot in cold wet soils. They are sometimes started in the cold frame with success at least on a small scale.

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Issued by
The Maryland Vegetable Growers' Association.
W. R. Ballard, Secretary-Treasurer.

Vol. XII, No. 5. College Park, Maryland. May, 1935.

The Rutgers Tomato. This new variety "was bred by Professor L. G. Schermerhorn of the New Jersey Agricultural College, from a cross of Marglobe and J. T. D., the latter a cannery tomato of the Chalk Jewel type. Rutgers is somewhat earlier than the Marglobe, nearly round, medium to large, red, and very well colored, inside and out. The flesh is very thick and the seed is sparse. It has been especially selected for canning and for juice, but is worthy of trial for market and home use. Rutgers is said to have a medium sugar content and low acidity."

It is understood that this variety is being planted quite extensively in New Jersey.

Treating Seeds and Seed Beds. Those who grow plants may be interested in two publications from the New York State Agricultural Experiment Station, Geneva, New York. They are bulletins No. 643, DUSTING MISCELLANEOUS SEEDS WITH RED COPPER OXIDE TO COMBAT DAMPING-OFF, and bulletin No. 650, ZINC OXIDE AS A SEED AND SOIL TREATMENT FOR DAMPING-OFF.

As is to be expected, the results of testing 107 species and varieties of plants with red copper oxide indicate varying degrees of control of damping-off as well as injury to the seeds treated. The rate of application and conditions of soil and other factors would of course modify the results. On the whole the use of this chemical gave very satisfactory results in the control of the damping-off diseases. The bulletin should be consulted for methods of application and for information as to the reaction of various kinds of seeds.

The recommended procedure is to treat the seeds with red copper oxide and to treat the soil with zinc oxide. Seeds should not be planted deeper than one-fourth inch for best results, and after planting the surface of the soil is covered with a sufficient amount of the zinc oxide to give a smooth, white layer. This requires about one-half ounce per square foot. The dry powder may be applied by dusting in a cheese cloth bag. Zinc oxide is a cheap chemical costing from ten to fifteen cents per pound in 200 pound lots.

Asparagus as a Food. "Nutrition specialists classify asparagus as a 'good' source of iron and a 'fair' source of calcium. They also tell us that fresh green asparagus is high in vitamin A and a good source of vitamin B if properly cooked. Asparagus scores among the lowest of all vegetables on carbohydrates with only three per cent of this ingredient."

Applying Fertilizers. The latest fad in fertilizer application is to place it in bands along the row, with beans and tomatoes using a 4-16-4 fertilizer the yields were equal to plots receiving double the quantity of fertilizer broadcast. While favorable results have been secured so far, it is evident that further testing is necessary before the method can be unqualifiedly approved for all crops. Seasonal variations may give a very different picture. Such concentration of fertilizer might prove disastrous with some crops in a dry season. However, the matter is of sufficient importance to warrant a cautious trial with the different vegetables.

Sanitary Measures. Because of the microscopic character of many of the plant diseases growers are apt to overlook the value of simple sanitary measures in their control. Roguing out individual plants and burning them may prevent the spread to many other plants. Discarding plants which show indication of diseases may avoid trouble later. A frequent source of trouble is pulling plants from beds when they are damp and allowing them to stay in a pile for several hours (as over night) may allow the whole lot to become infected. In bedding sweet potatoes cutting off the ends of the roots may indicate the presence of brown streaks and these roots should be discarded.

Other methods may be of value -- as for example the plowing under of old tomato fields after the picking season to destroy the spores of leaf spots.

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Issued by
The Maryland Vegetable Growers Association
W. R. Ballard, Secretary-Treasurer.

Vol. XII, No. 6. College Park, Maryland. June, 1935.

Planting Late Potatoes. The first part of July is usually considered the best time to plant late potatoes in the warmer sections of Maryland. This throws the formation of tubers into the cool fall season. One of the difficulties often encountered is that of securing a satisfactory stand. When cut potatoes are placed into the hot, dry soil in midsummer, rot may attack the cut pieces and cause considerable rot. Keeping seed stock on cold storage from April until ten days before planting time seems to aid in getting a stand. If one could maintain his seed-stock free from diseases it would be possible to select at digging time small tubers about egg-size and to plant these whole. Almost a hundred per cent stand can be secured in this way. However, if stock becomes diseased one might get an accumulation by selecting the small tubers.

Another method which can sometimes be used is to cut the potatoes sometime before planting. (It has been found that best yields are secured by planting cut pieces about egg-size). Tubers should be disinfected before cutting and this should be done before the buds make much growth or they will be injured by the disinfecting agent. Containers and other equipment coming in contact with the tubers should likewise be sterilized. Studies have shown that when cut potatoes are kept in a temperature of from fifty to sixty degrees F and with a humidity of eighty-five to ninety per cent, a thorough corking over of the cut surfaces will be effected in from seven to ten days.

Tubers which have formed a corky layer may be kept for a period of five or six months without appreciable loss in vitality.

Book for Vegetable Students. A copy of Dr. J. E. Knott's book VEGETABLE GROWING, in its second edition, has just come to hand. While this is designed primarily as a textbook for agricultural students, growers might find it a useful reference volume.

It covers such topics as: (1) Factors Affecting Plant Growth, (2) Classification of Vegetables, (3) Plant Growing Equipment, (4) The Seed Supply, (5) Seedage, (6) Producing Plants, (7) Soils and Their Preparation for Planting, (8) Maintaining Soil Organic Matter, (9)Fertilizing the Crop, (10) Cropping

Systems, (11) Moisture, (12) Insect and Disease Control, (13) The Garden Layout, (14) Storage, (15) Marketing, and a discussion of particular points in the culture of all the major vegetable crops.

The book is published by the Lea and Febiger Publishing Company, Philadelphia, Pennsylvania.

Food Values of Fresh Vegetables. Volume II, Number 15 of the CONSUMERS' GUIDE issued by the Consumers Counsel of the A.A.A. contains an All Year Vegeta ble Calendar which has general interest. Among other things it gives the monthly supplies of 22 vegeta bles as well as a discussion of the various vitamins and a table giving a list of 33 vegetables and their food values in vitamins, iron, calcium, protein, total carbohydrates, and full value per pound. It would be helpful for the housewife to have this chart posted in the kitchen for easy reference.

A copy may be had for the asking by addressing an inquiry to Chester C. Davis, Administrator, A. A. A., Washington, D. C.

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Issued by
The Maryland Vegetable Growers Association
W. R. Ballard, Secretary-Treasurer.

Vol. XII, No. 7. College Park, Maryland. July, 1935

Come To the Field Meeting! The Maryland Vegetable Growers Association is to have a Field Meeting at the Horticultural Farm of the University of Maryland on the afternoon of Tuesday, July 30th beginning at 2:00 P.M. The farm is located near Beltsville on the east side of the Washington-Baltimore Boulevard about twelve miles out of Washington.

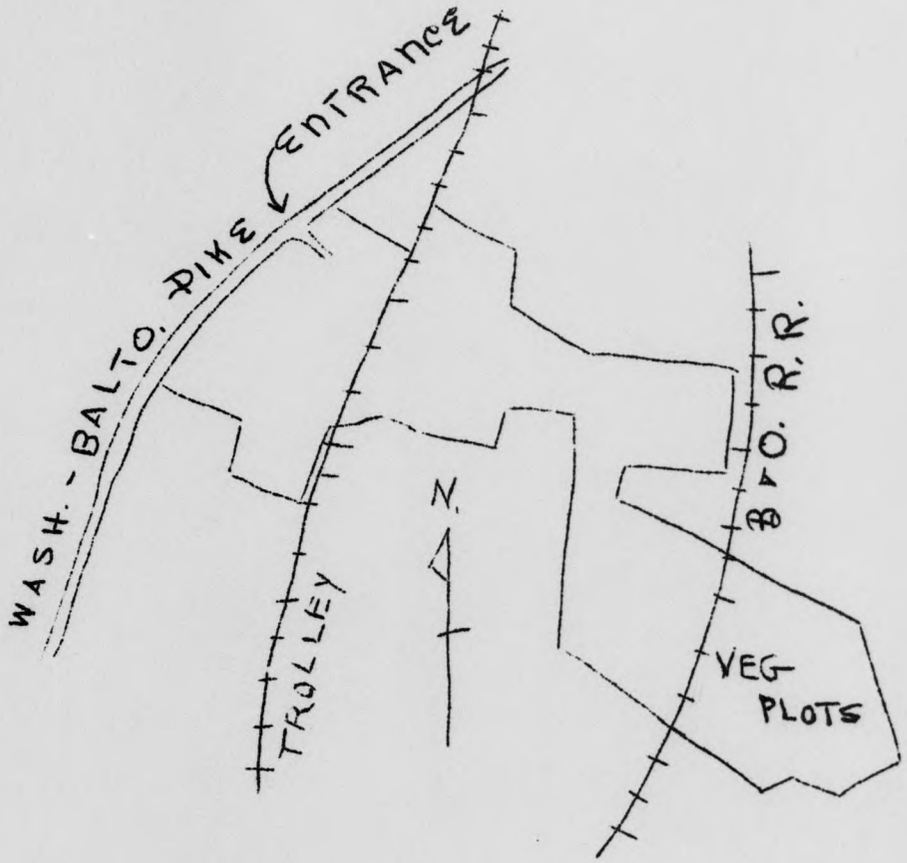
Experiment Station workers will be on hand to explain the investigations under way with the various vegetable crops. Of particular interest will be the plots of sweet corn, tomatoes, and beans. Variety and fertilizer tests and rotation series will be inspected. In addition selection work in the improvement of tomatoes, and experiments with sweet potatoes and cabbage will furnish points of interest.

An invitation is extended to all vegetable growers to attend this field meeting whether they are members of the Association or not.

The Federal Horticultural Farm is situated just across the Boulevard on the west and an opportunity will be given to inspect the grounds and the investigations in progress at this place.

The accompanying map will indicate the location of the vegetable plots and the entrance to the road from the Washington-Baltimore pike. Automobiles will be available at entrance for those coming by bus or other public conveyance. If you desire such accommodations it will be helpful if you will notify the Secretary in advance.

Bring a party of your neighbors and help make this a big day.



Horticultural
Farm

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VEGETABLE GROWERS' NEWS LETTER

Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard, Secretary-Treasurer.

Vol. XII. No. 8. College Park, Maryland. August, 1935.

Selection With Lima Beans. The production of reliable stocks of vegetable seeds has become so technical that the average grower must depend upon specialists for improved strains. It does seem, however, that growers of lima beans might build up selections which would be heavier yielders, perhaps because of better adaptation to local conditions. Such improvements appear to be more or less of a fluctuating character and continued selection must be followed to maintain high yielding strains.

The Use of Fertilizer. The proper use of fertilizer is a perennial problem which generally provokes discussion among vegetable growers. Much attention has recently been given to the placement of the fertilizer in relation to the plant. Strip application seems to be the latest idea. This is supposed to give the most economical method of distribution. Further experience, however, may not uphold the rosy promise of its advocates.

When manure was plentiful and fifty tons per acre could be applied many growers felt that nothing else was needed. Scarcity of manure has forced growers to turn more and more to commercial sources of fertilizers, and many have found that certain crops respond as well or better than from manure. For one thing the fertilizing elements in manure are not as quickly available as in chemical fertilizers. "Pieters has taken the availability of nitrogen in nitrate of soda as 100, in green manure as 65 and in stable manure as 25."

The average of 25 pounds of fertilizing elements in a ton of manure could be purchased in mineral form for about half what the manure would cost. It is true, of course, that manure adds the element of organic matter so much needed by most Maryland soils.

The more soils and fertilizers are studies the more complicated the problems seem to become. Recent investigations point to many of the minor and more obscure elements as being at times the limiting factor in plant responses, so that the future may see the development of elaborate methods for testing the needs of the soil for boron, magnesium, manganese, sulfur, and others not usually thought of in this connection. Some of these elements may affect adversely the growth of plants either when present in deficient quantities or in excess.

Variety Testing. Growers are generally interested in seeing tests of new varieties of vegetables and it sometimes pays the individual growers to try out on a small scale a few of the more promising sorts. He cannot be expected to make as careful records as do Experiment Stations, yet after all it is important to know how a new sort reacts under the conditions on the individual form.

Variety testing has long engaged the attention of Experiment Station workers and the results of such studies may indicate the forms most likely to prove of interest for local tests.

Just recently the University of Maryland has developed cooperative efforts along this line. In Garrott County, cool climate crops such as market peas, cauliflower, broccoli, brussels sprouts, and similar types have been tested with rather promising results. Near Salisbury new types of beans, cucumbers, and melons are being investigated. The growers have evinced considerable interest in these ventures.

A New Knott's Vegetable Growing. James E. Knott, Research Professor of Vegetable Crops, Cornell University, has revised his book on VEGETABLE GROWING and issued the second edition. While intended primarily for a first course for students, growers would no doubt find in it much of interest. The fundamentals of vegetable production are discussed, with more specific information relating to specific crops.

One feature of value is the selected list of references at the end of each chapter. Lea and Febiger, Philadelphia, Pennsylvania, are the publishers.

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VEGETABLE GROWERS' NEWS LETTER

Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard, Secretary-Treasurer.

Vol. XII. No. 9. College Park, Maryland. September, 1935.

Seed Potatoes. Seed potatoes grown in Maryland gave largest yields in tests conducted at Pocomoke, on the Eastern Shore, it is reported by Dr. R. A. Jehle, Specialist of the University Extension Service. These tests were conducted to compare the yielding qualities of potato seed from various sources.

The largest yield was obtained with fall-grown Irish Cobblers, which produced at the rate of 264 bushels of U.S. No. 1 and 37 bushels of U. S. No. 2 potatoes to the acre. Garrett county Katahdin seed made the second largest yield, with 255 bushels of U. S. No. 1 and 10 bushels of U. S. No. 2.

Results of tests and demonstrations that have been conducted throughout the state during the last few years have clearly shown, Dr. Jehle states, that it is not necessary for potato growers to go outside of Maryland to obtain their seed potatoes. This applies, he says, to all portions of the state, including the Eastern Shore, where large quantities of northern-grown seed are still being used.

It has been found during the last few years, he states, that late-grown Irish cobbler seed potatoes can be made to react just like northern-grown seed by raising the storage temperature during the latter part of the storage period.

Those who desire further information regarding the most favorable temperatures to maintain at various periods during storage of their potatoes, or on other points connected with production and use of Maryland-grown seed, are advised to get in touch with their county agent, or with Dr. Jehle at College Park.

The Consumer's Guide. This is a publication issued by the Consumer's Counsel of the Agricultural Adjustment Administration in cooperation with the Bureau of Agricultural Economics, Home Economics, and Labor Statistics.

It is designed to give the consumer full and correct information on prices, quality of commodities, and on costs and efficiency of distribution. Changes in prices and costs of food and farm commodities are reported. It believes that consumption is the end and purpose of production, and that the common interests of consumers and of agriculture far outweigh diversity of interests.

A New Scuffle Hoe. John D. Myers, 195 Pennsylvania Avenue, Westminister, Maryland demonstrated the Diamond Point Push Hoe at the recent Field Meeting at the University Horticultural Farm. The hoe is manufactured by the Eastern Diamond Point Push Hoe Company of Canton, Ohio. It seems to be made of good

material and is sturdily built. Such a type of hoe has many uses to which the ordinary hoe is not adapted. Growers might find it worthwhile to investigate the merits of this hoe.

Mushrooms. This crop is quite temperamental and success if often very uncertain unless the grower has excellent control of conditions and has learned by experience the essential routine.

For one thing spawn is a much more reliable commodity than it was some years ago. Horse manure has become scarce and yet this is the only material known giving good results. Even this material may be disappointing if certain kinds of bedding materials are used, or even if the animals have been fed the wrong kinds of food.

Mushrooms have insect and disease pests just as do other crops. Sanitary conditions are just as necessary with mushrooms as with any other vegetable if troubles are to be avoided.

Circular No. 27 of the United States Department of Agriculture discusses some of the insects and diseases attacking this crop.

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VEGETABLE GROWERS' NEWS LETTER

Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard, Secretary-Treasurer.

Vol. XII. No. 10. College Park, Maryland. October, 1935.

Nematode Control. Tests conducted by English experimenters indicate that calcium cyanamide may have properties which give it value as a controlling agent for nematodes. It is suggested that applications of 1200 pounds per acre be used three months before the crop is planted. Growers of carrots and other root crops might find it worth a trial if they have been having trouble with this pest.

Mr. Hotton Raises Maryland Golden Sweets. Mr. Wm. P. Hotton, Salisbury, Vice-President of the Association, has been attempting to establish a record for yields in the production of the sweet potato. Mr. Hotton is of the opinion that growers have been using too heavy applications of commercial fertilizers. His plots this year confirm his previous conclusions. Three test plots were run this year, each plot receiving a basic application of 1200 pounds of a 3-8-10 fertilizer. Plot 1 received in addition 200 pounds of sulphate of potash at the first cultivation. Plot 2 received no additional fertilizer while Plot 3 received 400 pounds additional potash.

Plots were accurately measured, dug and records taken on October 15th. The rows were 163.3 feet long and 10 rows in Plot 1 yielded 60 bushels which is at the rate of 609 bushels per acre. The check plot was next with 578.5 bushels while Plot 3 was last with an estimated yield of 564.4 bushels.

Mr. Hotton had 78 acres in Maryland Golden Sweet and he estimates that his yield over the entire area will be well over 300 bushels per acre. On the basis of a 300 bushel yield he claims his cost of production will average 37-1/2 cents per bushel. Mr. Hotton believes it is possible to produce 700 bushels per acre and he still hopes to demonstrate it.

He grades carefully after running potatoes through a brushing machine to clean them. The better grades have been selling for $1.25 per bushel on the New York market. His potatoes are clean, smooth, of good shape and remarkably free from disease. The rich golden color of the Maryland Golden Sweet enables them to command a premium on the market.

Culls are sold for canning, the rich flesh color giving an attractive appearance to the product.

The New Potato Law. The potato law passed by the last session of Congress has made more of a stir than most other processing laws. It appears to be the most drastic of all and the administration seems to be lukewarm about putting it into effect. Huey Long's filibuster prevented the appropriation of money for its enforcement, and Secretary Wallace appears to be working toward a voluntary acceptance on the part of the growers. Growers, however, are not in agreement as to the benefits to be received and there is quite a little active opposition to the law.

Farmers Marketing Troubles. Powell in his book on "Cooperation in Agriculture" sums up the situation in a statement to the effect that "no cooperative movement can succeed unless it is based upon economic necessity." The economic stress of recent years would seem to provide the stimulus for such effort but it is doubtful if cooperative organizations have functioned as well as they might. The Consumers Guide of September 16th, 1935 describes at some length the successful development of a farmer's cooperative at Harrisonburg, Virginia. Those interested in such ventures could no doubt afford to study the methods used by this cooperative.

Another movement which might be looked into is the Cooperative Saving Banks which might make it possible for the farmer to finance his operations with farmer owned funds.

Farmers have the solution to many of their problems in their own hands if they were willing to cooperate to that end.

How Big is Your Pumpkins? Considerable interest was aroused at the Frederick Fair through the offer of a special prize for the largest pumpkin. Although no records were broken, the heaviest specimen weighed 82-3/4 pounds.

VEGETABLE GROWERS' NEWS LETTER

Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard, Secretary-Treasurer

Vol. XII. No. 11. College Park, Maryland November, 1935

New Varieties of Vegetables

The American Seed Testing Associations' Committee, through its Chairman, W. Ray Hastings, reports the following selections of new vegetables worthy of a trial by growers in 1936.

Award of Merit Sorts:

Radish, Zwaan's Comet. Globe to olive-shaped, bright scarlet, stays in eating condition over long period, for forcing and home gardens.

Kohlrabi, Triumph of Prague. A white sort uniform in shape, size and color.

Parsley, Paramount. Deep green, extra triple and finely curled. Pure strain of ample size.

Pea, Confidence. Described by one Judge as having Little Marvel Pods, Perfection vine, and Thomas Laxton maturity.

Corn, Asgrow Golden Colonel. Described as a golden yellow Country Gentleman sweet corn. It is late, zig-zag kernel pattern, 7 ft. to 8 ft, tall, of fine quality and very uniform. It has large ears, deep kernels, and is very sweet.

Beet, Asgrow Canner. A dark red Detroit Red type, vigorous, uniform globe, with good sized tops.

Tomato, Burpee's Globe. Bright pinkish-red skinned, globe-shaped tomato, handsome, medium to large sized, prolific forcing and garden variety.

Special Mention Varieties:

Tomato, Fletcher's Special. To be held over until next year, on account of insufficient seed stocks.

Bean, U. S. No. 1. Dwarf Stringless Greenpod. To be held over because of loss seed crop by storm, originated by U.S.D.A.

Radish, Jewel. Uniform, half-long, blunt rooted, red, French breakfast type without the white tip.

Spinach, Bloomsdale Dark Green Selection F. Dark glossy green, extra curled Savoy type of compact habit. May be given name later.

Tomato, Penn State. Small compact plant type, heavily set with globe-shaped, rich scarlet fruits, evenly colored and umusually free from blemishes.

Half-Long Red Core Carrot and Globe Bunching Beet were among several others favorably mentioned. (Condensed from Florists' Exchange)

Program For Annual Meetings

The program for the annual meetings is now being made up. If you have any ideas or problems you think should be discussed, now is your time to get them into the pot. Otherwise, you will have to endure the discussion of topics provided for you. A tentative schedule of topics is being made up, but this can be changed if you let your wants be known at once.

Fertilizer Placement

The National Joint Committee on Fertilizer application is making a survey of planting methods, fertilizer placement and equipment used. It is intended that the scope of this survey cover fertilizer application practices with all important crops. In order to simplify the survey as much as possible, the crops have been classified annual horticultural crops, field crops, and fruits and nuts, and the groups of scientific men to whom the data forms are sent were selected accordingly.

When the information is collected and finally tabulated it will no doubt be made available to those interested in such data.

Horticultural Field Station

The Horticultural Field Station of the United States Department of Agriculture is located near Beltsville on the west side of the Washington-Baltimore boulevard.

Many lines of horticultural investigation are being conducted here in the fields, greenhouses and laboratories. Much of the work formerly conducted at Arlington, in Washington and at other places is being concentrated now at the new location.

Because of its accessibility, Maryland growers should take full advantage of the opportunity to follow the progress of investigations here along the lines of their interest.

The University of Maryland's Horticultural Farm is just across the road and the work being conducted here should not be overlooked.

Fresh Vegetables

Under date of September 24, the Consumers' Guide reports that average retail prices of potatoes, onions and cabbage were substantially below price levels of a year earlier. Forecast of total potato crop on October 1 was 366 million bushels as compared with the 5-year average of 363 million. The crop in the Northeast is relatively small while in north-central and Western states it is large.

Cabbage and onions continue plentiful with prices below the average.

Prices of lettuce, spinach, carrots, and many other vegetables were low throughout summer and fall.

Commercial production of most important truck crops is different from last year, but considerably above the 5-year period. Lettuce is 7% above, spinach 16% above and carrots 5% above. Increased supplies from small market and home gardens seems likely and this may account in part for low prices.

VEGETABLE GROWERS NEWS LETTER

Issued by
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W. R. Ballard, Secretary-Treasurer.

Vol. XII. No. 12. College Park, Maryland. December, 1935

Producing Sweet Corn Seed. (Extracts From Letter of R. G. Rothgeb). The procedure to be followed in producing sweet corn seed depends very largely upon the scale and duration of the venture. If only a small quantity of seed is to be produced, or if the seed is not to be grown continuously from year to year, the simplest methods will be most economical. However, if enough seed is to be grown to plant a large acreage, say several thousand acres, then more costly methods are justified. If extensive plans are contemplated they should be in line with the average price of sweet corn seed over a period of years.

The principles of sweet corn production and breeding are much the same as those for field corn and the interested grower should consult U. S. Department of Agriculture bulletins dealing with these subjects.

Small Scale Production by Mass Selection. Start with good seed of a well adapted variety such as Stowell's Evergreen, Narrow-Grain Evergreen, or Country Gentleman.

Select a field of high fertility, and well isolated from other fields of corn. Isolation is necessary to prevent crossing, as corn pollen is easily carried by the wind. Unless protected by a natural screen such as a woods or hill the seed plot should be at least half a mile from other fields, which are blooming at the same time. If possible have the seed field on the windward side for prevailing winds.

Do not plant the corn too thick. Two-plant hills spaced 3.5 feet each way is about right.

Harvest the seed when the husks are brown and loose. Husk the ears from standing stalks of healthy appearance.

Place the husked ears in a shed or barn in such a manner that air circulates around every ear. Thorough drying is very important. If a room with artificial heat and a fan to promote air circulation can be arranged, the corn can be harvested while the kernels are in the dough stage. Provided drying facilities are adequate early harvesting is better than allowing the ears to dry on the stalk as the former cuts down mold and insect damage.

After the ears are thoroughly dry, pick out the sound ears with good shape and desired kernel characteristics. Depending upon the closeness of selection about 25 to 75 per cent of the dry ears will be discarded. The remaining ears are shelled for seed. On this basis a three ton yield of green corn in the husk (as delivered to a canning factory) would produce 200 to 600 pounds of dry seed for planting.

THE MARYLAND VEGETABLE GROWERS' ASSOCIATION

Wednesday, January 15th, 9:30 A.M.

W. N. Eyler, President Presiding
W. R. Ballard, Secretary.

First Session

9:30 A.M. Call to Order, - - - - - - - - - - - - - - - President, W. N. Eyler.

9:35 A.M. Spinach Insects, - - - - - - - - - - - - - Dr. E. N. Cory, University of Maryland.

10:20 A.M. Developing Disease Resistance in Tomatoes, - - - - - - - - - - - - - - - - - Mr. Wm. S. Porte, U. S. Department of Agriculture.

11:05 A.M. Truck Transportation of Fruits and Vegetables in Maryland, - - - - - - - - - Mr. Ralph Russell, University of Maryland.

Thursday, January 16th, 9:30 A.M.

Second Session

9:30 A.M. The Federal Potato Law, - - - - - - - - - Mr. S. B. Shaw, University of Maryland.

10:15 A.M. New Varieties and Strains of Vegetables - - - - - - - - - - - - - - - - - Mr. Roy Magruder, U. S. Department of Agriculture.

11:00 A.M. Sweet Corn Trials in Maryland - - - - - - Mr. Russell G. Rothgeb, University of Maryland.

Report of Committees.

March 15, 1935.

Mr. L. A. Carder,
Oldtown, Maryland.

Dear Mr. Carder:

Your letter to Mr. J. A. Ewing requesting information for growing sweet corn for seed has been referred to me.

The procedure to be followed in producing sweet corn seed depends very largely upon the scale and duration of the venture. If only a small amount of seed is to be produced, or if the seed is not to be grown continuously from year to year, the simplest methods will be most economical. However, if enough seed is to be grown to plant a large acreage, say several thousand acres, then more costly methods are justified. In any case, one must not be influenced too much by the cost of seed at present. The high prices for 1934 seed are largely due to an unusually low supply of seed following the extensive drought of last summer. If extensive plans are contemplated they should be in line with the average price of sweet corn seed over a period of years.

The Maryland Station has no up-to-date publication on the production of sweet corn seed. Therefore, I will note in this letter some points to be observed in small scale production. The principles of sweet corn seed production and breeding are much the same as those for field corn. Therefore, I am having two U. S. Dep't. of Agriculture bulletins sent to you which have to do with the latter.

Consideration in small scale sweet corn seed production by mass selection -

1. Start with good seed of a well adapted variety such as Stowell's Evergreen, Narrow-Grain Evergreen, or Country Gentleman.

2. Select a field of high fertility, and <u>well isolated</u> from other fields of corn. Isolation is necessary to prevent crossing, as corn pollen is easily carried by the wind. Unless protected by a natural screen such as a woods or hill the seed plot should be at least half a mile from other fields, which are blooming at the same time. If possible have the seed field on the windward side for prevailing winds.

3. Do not plant the corn too thick. Two-plant hills spaced 3.5 feet each way is about right.

4. Harvest the seed when the husks are brown and loose. Husk the ears from standing stalks of healthy appearance.

5. Place the husked ears in a shed or barn in such a manner that air circulates around every ear. Thorough drying is very important. If a room with artificial heat and a fan to promote air circulation can be arranged, the corn can be harvested while the kernels are in the dough stage. Provided drying facilities are adequate early harvesting is better than allowing the ears to dry on the stalk as the former cuts down mold and insect damage.

6. After the ears are thoroughly dry, pick out the sound ears with good shape and desired kernel characteristics. Depending upon the closeness of selection about 25 to 75 per cent of the dry ears will be discarded. The remaining ears are shelled for seed. On this basis a three ton yield of green corn in the husk (as delivered to a canning factory) would produce 200 to 600 pounds of dry seed for planting.

The above outline, of course, is very brief and omits many necessary details. It applies to the very simplest type of seed production, but is practical for the grower who wishes to produce homegrown seed. Programs of corn improvement involving the principle of hybridization are being used successfully by specialized corn breeders. Such work is expensive, time consuming, and requires much technical knowledge.

Very truly yours,

R. G. Rothgeb,
Assoc. Agronomist (Plant Breeding)

RGR-MHR

CORN EARWORM INVESTIGATIONS

In 1934 observations were made on a number of plots of sweet corn in co-operation with the Agronomy Department as had been done the preceding two years. In general, the injury was the lowest of the three years of observation, 1932 being the season of highest or greatest damage. There was considerable difference in the resistance of the various varieties to corn earworm injury. The per cent damage varied from .5 to 11.5 in 1932, from .3 to 3.6 in 1934. The twelve least damaged varieties, as well as the two worst injuried varieties, for each of the three years are shown in Table I.

TABLE I

1932	% Damage	1933	% Damage	1934	% Damage
Hopeland	.5	Country Gentleman D19.24 A. S. G.	.5	Narrow Grain Del. Str.	.3
Country Gentleman Ind. 709	.8	Show Peg M.	.5	Hopeland	.4
Narrow Grain D26.23 A. S. G.	.8	Hopeland	.6	Narrow Grain Hyb D26.23 A. S. G.	.5
Harry's Hyb.	.9	Narrow Grain D26.23 A. S. G.	.9	Early Evergreen F.	.5
Country Gentleman, O. P. Land.	1.1	Narrow Grain, Del. Str.	.9	Country Gentleman O.P. U22.4 A. S. G.	.6
Country Gent. Hyb. D19.24 A. S. G.	1.2	Country Gentleman O.P. 22.4 A.S.G.	1.0	Country Gentleman U9.19 A. S. G.	.6
Narrow Grain Del. Str.	1.4	Country Gent. Hyb Ind. 2222	1.0	Golden Country Gent. U26.2 A. S. G.	.6
Narrow Grain O. P. 2041, Conn.	1.4	Country Gent. Hyb. Ind. 2234	1.0	Country Gent. Hyb U24.19 A. S. G.	.7
Country Gentleman D22.4 A. S. G.	1.5	Country Gent. Hyb. Ind. 2240	1.1	Midwest Country Gent: U21.1 A. S. G.	.7
Shoe Peg M.	1.6	Country Gentleman N19.9 A. S. G.	1.1	Top Cross Country Gent. U25.5 A.S.G:	.7
Late Evergreen F.	1.7	Country Gentleman D20.24 A. S. G.	1.2	Country Gentleman Ind. 2222	.8
Evergreen Hyb. D26.63 A. S. G.	1.7	Narrow Grain N26.15 A. S. G.	1.2	Country Gentleman Ind. 2234	.8
Golden Bantam 8 rowed, A. S. G.	11.5	Golden Cross Bantam	1.7	Golden Cross Bantam	1.5
Golden Bantam, O. P.: T. W. Woods	10.5	Golden Bantam Land.	4.4	Golden Bantam Land.	3.6
		Golden Bantam Land.	4.3	Whipples Yellow O. P. A. S. G.	3.2
Total Entries 145		34		55	

Note:
O. P. - open pollinated
Hyb. - Hybird

Golden Cross Bantam, the least injured of the golden bantam types is also given because of the rising interest in it. The variatios which have been consistently among the top twelve for all three years are underlined. It is well to note that some of the higher ranking varieties in earworm resistance were discontinued after one year's trial because of some undesirable factor other than corn earworm susceptibility. Some varieties used only two years were in the high twelve both years, as Country Gentleman 2234 and Country Gentleman 2222.

Honey June and Surcropper Sugar are two varieties of sweet corn developed by the Texas Experiment Station which show considerable resistance to corn earworm. This is shown in Table II (From Texas Circular 69).

TABLE II.

VARIETY	% FREE FROM WORMS	% MARKETABLE EARS
	Winter Haven, Texas 1933	
Honey June	4.5	84.8
Surcropper Sugar	4.8	73.8
Golden Sunrise	1.3	30.9
Golden Bantam	8.8	28.3
Stowells Evergreen	1.3	7.7
	College Station, Texas 1933	
Surcropper Sugar		99.0
Honey June		98.0
Stowells Evergreen		83.0
Golden Bantam		44.0

These two varieties grow to a greater height than Stowells Evergreen and require about 80 to 90 days to reach maturity. They have not been tried sufficiently at this station to permit any conclusions to be drawn as to their adaptability to Maryland conditions. A small plot of Honey June in 1934 was 15% infested, no ears were badly injured. Ears are characterized by extremely tight, long husks.

There have been several favorable reports with the use of poison spray baits for control of the corn earworm. These baits, composed of invert sugar and tartar emetic, were applied about the edge of corn fields, the applications being made every evening after sundown during the silking period. Moths are reported to be attracted in large numbers and feed greedily on the bait. It is further reported that large numbers of dead moths could be picked up in the field.

Because of the favorable results reported by this method, and because a review of the literature indicates but little work on the use of baits, we have been working toward this method of control for the past two years. The first logical step seemed to be the determination of the most attractive sugar and the minimum concentration at which it is effective. It was found in laboratory tests that sucrose (canesugar) was most attractive, and attractive at a lower concentration than any other sugar. Field tests with bait pails confirmed laboratory tests, sucrose baits catching twice as many moths as a more concentrated bait of invert sugar.

The next step then was to find what poison would be most suitable and what concentration of poison would be necessary to kill the moths in a short time. Preliminary experiments have been made with several poisons. The poisons tested were fed to moths in a solution of sucrose, and both the amount of solution and poison taken accurately measured. Knowledge of both of these factors being necessary in order to determine the concentration of insectcide to be used under field conditions. The results are given in Table III.

TABLE III.

INSECTICIDE	AMOUNT OF SOLUTION TAKEN	AMOUNT OF POISON TAKEN	SURVIVAL TIME IN MINUTES
Sodium arsenite	.0010 gm.	.04 mg	18
Tartar emetic	.0155 gm.	.62 mg.	620
Thallium sulphate	.055 gm.	.20 mg.	230
Sodium fluoride	.0180 gm.	.18 mg.	75
Pyrethrum	.000 gm.		

Preliminary experiments with these various poisons indicate that an effective concentration is much greater than necessary in sprays against leaf feeding insects, i. e., 1 to 3 pounds to 50 gallons. Indications are that ten to fifteen pounds to fifty gallons will be necessary to kill earworm moths in a minimum length of time. Of course such a concentration of soluble poison could be applied to plants, but is intended for use in a feeding type of trap. One type of feeding trap which we have made has been observed in the field; when baited with a fermenting mixture and a poisoned invert sugar solution, moths of all descriptions were attracted to it and fed in large numbers. Inability to kill such moths is now believed due to insufficient poison. In view of the results of laboratory work we believe there is a good chance of killing moths with poison bait traps. Experiments to this end will be carried out this coming season.

L. P. Ditman
February 25, 1935

N. Sulphate for pea aphis
1 - 500
4 lbs fish oil
Soap
Effective in Garrett Co -
- Cony
aphis injury correlated with moisture problem:
Best time for application when blooming begins -

SWEET CORN FIELD TRIALS
AT
COLLEGE PARK, MARYLAND

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Special Report - February 26, 1935.

R. G. Rothgeb

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Department of Agronomy
University of Maryland Agricultural Experiment Station

SWEET CORN FIELD TRIALS

at

College Park, Maryland.

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The data reported were obtained from variety trials conducted on the Clay Farm at College Park for the years 1931, 1932, 1933, and 1934. Various sweet corn varieties and hybrids were grown under comparable conditions as a part of the corn improvement program of the Agronomy Department.

Methods

Soil Management: The trials for all four years were located in the same field. Adjacent strips of plot land were alternated in a two year rotation of sweet corn and fall sown small grain, a grass-clover mixture being seeded with the latter. The land is a sandy loam of medium fertility. Previous to plowing for corn a liberal application of barnyard manure was made, and before planting 400-500 pounds of a high grade complete fertilizer was drilled in.

Planting: Planting was done from May 18 to May 23 in hills spaced 3.5 feet each way. The stand was subsequently thinned to two plants per hill. Each test entry was replicated in four plots distributed over the experimental area. Each plot consisted of 9 hills in 1931 and 1933, and 10 hills in 1932 and 1934.

Records

Name: In most cases the name or number given by the distributor of the seed is used. A star is placed after each stock known to have been produced or listed for commercial use. The majority of entries listed as hybrids are first generation crosses or top crosses. However, in several cases the material is open pollinated but of hybrid origin. Hopeland and Golden Colonel are in the latter class.

Source of Seed: Much of the material has been supplied voluntarily. The following persons have kindly furnished samples of their seed stocks for these trials:

Dr. D. F. Jones, Connecticut Agr. Expt. Station (abbreviated C.A.E.S.

Dr. G. H. Rieman and Mr. Everett B. Clark,
Associated Seed Growers, New Haven, Conn. (Asgrow)

Mr. G. M. Smith, U.S.D.A. and Purdue Univ. Agr. Expt.Sta. (G.M.S.)

Mr. H. L. Mills, D. Landreth Seed Co., Bristol, Pennsylvania.

Mr. W. A. Huelsen, Illinois Agr. Expt. Sta. (Ill. E. S.)

Mr. Nelson H. Fooks, Mount Airy Canning Company

Messrs. H. A. Hunter and T. D. Holder, Univ. of Md. Exten. Service

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Messrs. H. A. Hunter and T. D. Holder, Univ. of Md. Exten. Service

Mr. T. H. White, Univ. of Md. Agr. Expt. Station (M.A.E.S.)
Mr. B. F. Wesley, (B.F.W.), Blamberg Bros., Baltimore, Md.

Other material came from:

F. O. Mitchell and Brother, Perryman, Maryland.

Charles T. Wrightson & Son, Easton, Maryland.

Thomas and Company, Frederick, Maryland.

Mr. Edgar Harry, Roland Park, Maryland.

F. H. Woodruff & Sons, (F.H.W.), Milford, Connecticut.

T. W. Wood & Son, (T.W.W.), Richmond, Virginia.

Maturity: During the flowering period of each variety or hybrid a day-to-day count was made of plants showing silks. Depending upon the lateness of the variety, and the appearance of the ears, harvesting was done 17-22 days after approximately one half of the plants had silked. In 1931 and 1932 the corn was pulled 1-2 days younger than in 1933 and 1934. Silking records have been of great value in predicting the probable harvesting date.

Premature Dying: Plants which show wilting, or have a greyish appearance, or present excessive firing of the upper leaves at the time of harvesting are put in this class. Wilt, root-rot, and general inability to withstand adverse growth conditions such as drought are largely responsible for such symptoms. Although this observation does not differentiate causes, it does give some measure of plant vigor.

Length of Ear: The average length of husked marketable ears.

Yield: The weight of the corn in the husk as it came from the field is given as total yield. All ears of sufficient size to have kernels on them were pulled. Due to the inclusion of nubbins which the practical grower would probably leave in the field, these yields are slightly large, and the percentage of husked marketable ears is correspondingly small. No correction is made for stand unless plants were missing on account of causes extraneous to the seed.

Marketable ears are ears suitable for canning or market exclusive of culls. Culls consist of immature ears, poorly filled ears, ears having less than three inches of their length filled with kernels, smutted ears, and ears with worm injury too deep for trimming.

For the benefit of the market gardener the number of marketable ears is given in dozens per acre. Thicker planting doubtless would increase this number considerably, especially on fertile soil.

#1

Observations Based on the Trials

1. Many hybrids which do well in other parts of the country are not adapted to Maryland. It is just as necessary, if not more so, to test hybrids as it is varieties.

2. Golden Cross Bantam has done well for four years, and is to be recommended where it is desired to grow a yellow corn of excellent canning quality with short fodder and maturing a week to ten days earlier than Evergreen. In yield of marketable ears it has compared favorably with Evergreen, and has far surpassed 8-row Golden Bantam.

3. In these trials an Evergreen hybrid (Asgrow 14.5) has outyielded open pollinated Evergreen from Connecticut, but has not equalled a home grown strain of Evergreen. In uniformity and ear quality the hybrid has been superior.

4. Several Narrow Grain Evergreen hybrids have shown up well. Purdue 503 has been consistently high for three years. However, it has shown a tendency toward divided ear tips and branched ears. Asgrow 26.15 has been tried for two years, and at present seems to be a very promising hybrid for Maryland.

5. No Country Gentleman hybrid has been included which has consistently outyielded good open pollinated stocks. In 1934 a Yellow Country Gentleman hybrid (Asgrow Golden Colonel) performed equally as well as commercial stock.

6. Suncross P39 from the Connecticut Experiment Station is a yellow top cross which outyielded Golden Cross in 1934. Further tests are needed to establish its value.

7. Top crossed Spanish Gold gives promise as a 70 day yellow hybrid.

8. Landreth's Money Maker has been outstanding for sweetness of kernel.

9. Hopeland, a sweet x dent hybrid bred by the Maryland Station, has yielded well but has been somewhat deficient in quality.

SWEET CORN FIELD TRIALS

1934

Clay Farm,
College Park, Md.

Planted May 23.

Variety or Hybrid	Source of Seed	Days to Maturity	Plants Dying Early Pct.	Ave. Ear Length Inches	Yield per acre green Total Tons	Husked Tons	Marketable Ears Pct.	Marketable Ears Doz.
Stowell's Evergreen - Variety								
Local Strain	M.A.E.S.	83	2.6	8.2	3.56	2.10	59	524
Late Selection	Fooks	83	1.5	8.5	3.44	1.62	47	441
Early Selection	"	79	1.4	8.2	3.16	1.50	47	456
Landreth's *	Landreth	77	4.5	7.9	2.82	1.57	56	480
U95.1 *	Asgrow	89	1.4	7.4	2.92	1.32	45	365
Stowell's Evergreen - Hybrid								
Hopeland	M.A.E.S.	85	.9	8.6	4.12	2.34	57	625
U14.5 *	Asgrow	86	.0	8.0	3.09	1.76	57	570
U14.5(63)	"	83	2.8	8.3	3.13	1.67	53	492
Redgreen N272.1 *	"	82	13.6	7.4	2.97	1.62	55	711
" *	Landreth	82	12.1	6.8	2.38	1.17	49	623
Narrow Grain Evergreen - Variety								
J.C.C. Strain	Thomas	86	.0	7.1	3.81	2.13	56	835
H. & H. "	"	87	.0	7.1	3.43	1.96	57	880
Home Grown Strain	Wrightson	87	3.6	7.2	3.19	1.68	53	500
N204.2 *	Asgrow	89	4.5	7.2	2.87	1.32	46	370
Narrow Grain Evergreen - Hybrid								
N26.15 *	Asgrow	85	.0	7.3	4.10	2.47	60	824
D26.23	"	84	1.6	7.5	3.91	2.05	52	748
D26.8 *	"	83	.0	7.7	3.34	2.00	60	631
U26.63	"	83	.0	8.1	3.56	2.02	57	577
503	G.M.S.	83	1.3	7.8	4.14	2.21	53	699
Country Gentleman - Variety								
Landreth's *	Landreth	83	.0	8.4	3.22	1.86	58	653
Mid-West N21.1 *	Asgrow	84	1.4	7.8	3.18	1.89	59	671
U22.1 *	"	84	.0	7.7	2.92	1.77	61	655
U22.2 *	"	85	.0	8.0	2.80	1.45	52	471
Country Gentleman - Hybrid								
Top Cross U25.5 *	Asgrow	83	1.4	7.9	3.09	1.64	53	577
U24.19	"	84	.0	8.4	3.04	1.94	64	600
U9.19 *	"	85	1.5	7.8	2.91	1.53	53	574
U26.2 (Golden C.)*	"	84	.0	7.4	3.19	1.72	54	624
2234	G.M.S.	79	.0	7.4	2.95	1.78	60	720
2222	"	79	.0	6.6	2.48	1.35	54	754

1934 - continued

Variety or Hybrid	Source of Seed	Days to Maturity[1]	Plants Dying Early Pct.	Ave. Ear Length Inches	Yield per acre green Husked Total Tons	Yield per acre green Husked Marketable Ears Tons	Yield per acre green Husked Marketable Ears Pct.	Yield per acre green Husked Marketable Ears Doz.
Miscellaneous White - Variety								
Money Maker *	Landreth	87	..0	8.5	4.25	2.02	48	661
Howling Mob *	"	79	17.0	8.0	2.40	1.19	50	398
Early Crosby *	"	76	31.9	7.2	1.26	.60	48	304
Miscellaneous Yellow - Variety								
Golden Sunrise *	Landreth	68	21.5	6.7	1.11	.53	48	262
Late G. Sunrise *	"	78	5.9	8.5	2.46	1.14	46	408
Bantam Evergreen *	"	83	14.1	8.1	2.78	1.46	53	505
" Ev. U12.4 *	Asgrow	79	17.1	8.1	2.28	.96	42	306
Whipple Yel. U178.1*	"	75	23.0	7.6	2.49	1.09	44	424
G. Sunshine D168.1 *	"	70	37.9	6.8	.60	.23	39	112
Golden B. N172.5 *	"	72	12.8	7.0	1.83	.71	39	319
Burbank B. U135.1 *	"	72	12.1	6.7	2.11	1.04	49	461
Golden Bantam *	Landreth	73	12.0	7.5	1.80	.82	46	471
Yellow - Hybrid								
Golden Cross B.	G.M.S.	77	12.8	7.9	2.45	1.42	58	608
" " " *	Landreth	77	9.6	8.1	2.47	1.52	62	664
" " U138.9 *	Asgrow	77	3.2	8.0	2.78	1.56	56	670
Top Cross B. U140.1*	"	75	13.2	7.8	2.56	1.48	58	714
" " " U135.2	"	72	5.0	7.7	2.66	1.46	55	577
" " " U174.7	"	76	13.2	7.6	2.31	1.35	58	600
Golden B. 5109	G.M.S.	78	20.3	7.4	2.25	1.17	52	680
" " 5103	"	77	20.5	7.5	2.01	1.08	54	471
Suncross P39 *	C.A.E.S.	77	1.3	8.0	2.87	1.72	60	651
Whipcross P39 *	"	76	10.3	7.8	2.51	1.39	55	555
Top C.Whipple U180.5*	Asgrow	76	18.1	7.3	2.50	1.36	54	533
" " Sunshine U168.6*	"	70	15.9	7.2	2.38	1.31	55	493
" " Span.Gold U170.1*	"	70	5.3	6.9	2.71	1.36	50	654
Tendergold *	F.H.W.	70	21.8	7.3	1.88	1.11	59	486
Bantam Ev. U15.39	Asgrow	78	8.5	8.3	2.36	1.43	61	464
" " U24.39 *	"	79	4.1	7.8	2.52	1.46	58	517
" " U 8.15 *	"	83	1.5	7.5	3.06	1.82	59	590
" Ev. Top C. U13.2	"	79	7.6	7.9	2.87	1.61	56	609

[1] The corn was harvested 19 - 21 days after one half of the plants had silked. The later the variety the longer harvesting was delayed.

* Listed for commercial use.

SWEET CORN FIELD TRIALS

Clay Farm,
College Park, Md.

1933

Planted May 18.

Variety or Hybrid	Source of Seed	Days to Maturity [1]	Plants Dying Early Pct.	Ave. Ear. Length Inches	Yield per acre green: Total Tons	Husked Tons	Marketable Ears: Pct.	Marketable Ears: Doz.
Stowell's Evergreen - Variety								
Evergreen	M.A.E.S.	83	0.0	7.9	2.88	1.47	51	409
" N96.3 *	Asgrow	86 y	1.7	8.2	3.06	1.56	51	414
" Early	Fooks	83	.0	8.0	2.78	1.45	52	392
" *	Landreth	81	3.6	7.5	2.27	1.25	55	400
Stowell's Evergreen - Hybrid								
Hopeland	M.A.E.S.	87	.0	8.7	3.74	2.01	54	531
Early Ev.Hyb.D14.5*	Asgrow	84	3.6	8.2	3.10	1.71	55	479
Top Crossed Ev.	C.A.E.S.	85	2.4	8.5	1.96	.71	36	149
Narrow Grain Evergreen - Variety								
Nar.Grain(1931 seed)	Holder	88	.0	7.1	3.17	1.68	53	672
" " N204.3 *	Asgrow	90 y	.0	7.1	2.70	1.30	48	409
Narrow Grain Evergreen - Hybrid								
D63.26	Asgrow	85	.0	7.9	3.55	1.95	55	505
N26.15	"	84	.0	7.4	3.73	2.13	57	479
N26.8 *	"	85	.0	7.3	2.61	1.36	52	423
N 8.15	"	85	11.1	7.8	2.50	1.43	57	391
D26.23	"	86	.0	7.5	3.36	1.75	52	584
506	G.M.S.	84	.0	7.7	3.27	2.00	61	609
503	"	84	1.6	7.5	3.91	2.23	57	635
533	"	84	.0	7.1	3.14	1.76	56	585
Country Gentleman - Variety								
Country Gent. 22.4*	Asgrow	84	.0	7.7	2.90	1.57	54	528
" " *	Landreth	89	.0	7.6	2.43	1.31	54	461
Shoepeg	Mitchell	84	.0	7.6	2.55	1.43	56	583
Country Gentleman - Hybrid								
N19.9 *	Asgrow	84	3.2	7.9	3.50	2.21	63	689
D20.24	"	84	.0	7.2	2.60	1.59	61	496
N24.7	"	84	1.6	8.0	3.04	1.85	61	558
D19.24	"	84	.0	8.3	2.91	1.60	55	475
2234	G.M.S.	82	.0	6.6	3.31	1.92	58	694
2222	"	82	.0	6.2	2.25	1.19	53	567
2240	"	83	1.7	7.2	2.28	1.32	58	521
Miscellaneous - Variety								
Honey Maker *	Landreth	88	.0	8.7	3.44	1.82	53	586
White Sunrise B'30 *	"	81	3.7	8.6	2.63	1.26	48	428
Golden " B'30 *	"	81	5.4	8.2	2.68	1.34	50	495
" " 169	"	81	1.8	8.6	3.31	1.66	50	605
Golden Bantam *	"	78	25.5	7.2	1.23	.43	35	278
Bantam Evergreen *	T.W.W.	78 y	2.1	7.4	2.55	.89	35	344

Variety or Hybrid	Source of Seed	Days to Maturity [1]	Plants Dying Early Pct.	Ave. Ear Length Inches	Yield per acre green Total Tons	Husked Tons	Marketable Ears Pct.	Marketable Ears Doz.
Yellow - Hybrid								
Golden Cross B. *	G.M.S.	78	1.7	7.4	3.41	1.64	48	781
Yellow Hyb.#1421	"	78	1.5	7.4	2.51	1.41	56	531
" " #1330	"	78	1.8	6.8	2.43	1.12	46	614

[1] Harvested 20 days after one half of plants had silked.

* Listed for commercial use.

y Pulled relatively young.

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SWEET CORN FIELD TRIALS

1932

Clay Farm,
College Park, Md.

Planted May 19.

Variety or Hybrid	Source of Seed	Days to Maturity [1]	Plants Dying Early Pct.	Ave. Ear Length Inches	Yield per acre green Total Tons	Husked Tons	Marketable Ears Pct.	Marketable Ears Doz.
Stowell's Evergreen -Variety								
Ev. (Late 2 yrs.)	Fooks	88	2.9	8.2	3.40	1.90	56	548
" (Early 2 yrs.)	"	84	1.2	8.5	3.31	1.92	58	549
" (Early 1 yr.)	"	84 y	4.1	8.1	2.85	1.51	53	490
" *	Landreth	81	---	7.7	3.00	1.56	52	519
" Improved D98.3 *	Asgrow	88	1.3	8.4	3.07	1.93	63	437
" D96.1 *	"	88	.0	7.6	2.97	1.60	54	333
" *	T.W.W.	85	1.6	8.1	2.46	1.38	56	459
Stowell's Evergreen - Hybrid								
Hopeland	M.A.E.S.	89	.4	8.7	3.02	1.63	54	448
Evergreen D16.5	Asgrow	86	.0	8.3	2.54	1.50	59	460
Early Ev. D14.5 *	"	86	.0	8.4	2.84	1.56	55	466
Green Cross F	C.A.E.S.	88	2.9	8.9	3.56	2.03	57	540
" " P	"	88 y	10.3	9.0	2.54	1.50	59	392
" " S	"	88	6.2	9.1	3.30	2.05	62	488
Narrow Grain Evergreen - Variety								
Narrow Grain	Holder	93	.0	6.8	2.85	1.54	54	614
" " D204.3 *	Asgrow	91	3.9	7.3	2.46	1.30	53	407
" " D204.1 *	"	88	4.0	7.6	2.58	1.52	59	496

Variety or Hybrid	Source of Seed	Days to Maturity [1]	Plants Dying Early Pct.	Ave. Ear Length Inches	Yield per acre green Total Tons	Husked Tons	Marketable Ears Pct.	Marketable Ears Doz.
Narrow Grain Evergreen - Hybrid								
D26.63	Asgrow.	88	.0	8.4	4.36	2.40	55	688
D 9.14	"	88	1.5	7.6	2.76	1.74	63	614
D26.8 *	"	84	1.4	7.9	3.06	1.81	59	644
D26.23	"	88	.0	7.3	3.62	2.03	56	740
503	G.M.S.	85	1.3	7.5	3.84	2.23	58	747
509	"	86	.0	6.2	2.66	1.44	54	555
533	"	86	.0	7.1	3.59	2.05	57	718
Country Gentleman - Variety								
Shoepeg	Mitchell	92	1.6	7.5	2.45	1.50	61	525
D22.4 *	Asgrow	88	.0	7.6	2.98	1.79	60	585
Country Gentleman *	Landreth	88 y	.0	7.2	2.23	1.16	52	426
Country Gentleman - Hybrid								
D19.24	Asgrow	85	.0	8.5	2.86	1.75	61	555
D20.24	"	85	.0	7.5	2.12	1.34	63	451
D20.10	"	85	2.3	6.5	1.77	1.04	59	436
709	G.M.S.	82	.0	6.9	2.22	1.18	53	577
Miscellaneous White - Variety								
White Sunrise *	Landreth	81	--	8.3	2.91	1.57	54	572
Money Maker *	"	88	.0	8.3	2.74	1.45	53	540
Harry's Hybrid	Harry	91	.0	6.7	2.48	1.09	44	488
Yellow - Variety								
Golden Bantam *	Landreth	78	18.8	6.7	2.21	1.06	48	681
" B. D136-3 *	Asgrow	78	42.9	6.1	1.44	.68	47	466
" "Imp.D173-2 *	"	78	31.0	6.5	2.12	.91	43	459
" " *	T.W.W.	78	40.7	6.1	.80	.38	48	244
" Giant #159 *	"	78	10.9	7.3	1.11	.56	51	475
Bantam Ev. #163 *	"	81	6.6	8.1	2.99	1.62	54	570
Yellow - Hybrid								
D15.16	Asgrow	78	100.0	--	Failure		-	--
D15.39	"	78	31.3	6.9	2.06	1.01	49	577
D16.39	"	78	27.1	7.8	1.85	1.00	54	459
Top Cross - 10-14 Row x 39 *	"	78	11.0	7.4	2.63	1.39	53	607
603	G.M.S.	81	3.0	7.6	2.67	1.44	54	659
Golden Cross B. *	"	81	1.4	8.4	3.38	2.06	61	770

[1] Harvested 18 - 20 days after one half of plants had silked.

* Listed for commercial use.

y Harvested relatively young.

SWEET CORN FIELD TRIALS

Clay Farm,
College Park, Md.

1931

Planted May 19-20

Variety or Hybrid	Source of Seed	Days to Maturity [1]	Plants Dying Early Pct.	Yield per acre green Total Tons	Husked Tons	Marketable Ears Pct.	Marketable Ears Doz.
Evergreen - Variety							
Evergreen (1930)	Fooks	87	1.6	2,81	1.58	56	463
31-36% Starch Selection	"	86	.0	2.96	1.80	61	529
Late 31-36% St. Selection	"	87	.0	3.33	1.90	57	520
Early Ev. (F.H.W. Co.)	"	83	4.7	2.87	1.74	61	501
Early Ev. 25-31 St. Sel.	"	86	4.0	3.43	2.14	62	529
Evergreen (Idaho grown)	B.F.W.	86	4.3	3.30	1.93	59	550
Early Ev. "	"	81	10.0	2.15	1.23	57	396
Evergreen	Landreth	87	.0	2.60	1.47	57	412
"	C.A.E.S.	83	1.9	2.54	1.50	59	430
Early Evergreen	"	78 y	3.3	2.87	1.48	52	514
Evergreen - Hybrid							
Hopeland	M.A.E.S.	86	1.2	3.58	2.07	58	576
345 (63)x345(50)#1	C.A.E.S.	87	.0	2.72	1.67	61	387
" " #2	"	87	4.7	3.17	1.92	61	459
" " #3	"	83 y	.0	2.47	1.43	58	401
T23.5	"	86	.0	3.77	1.55	41	504
T50.63	"	86	1.7	2.73	1.85	68	470
T16.5	"	83	.0	3.12	1.79	57	545
T14.5	"	83	.0	2.98	1.89	63	554
T22.23	"	86	.0	3.32	1.78	54	599
Green Cross #4	"	86	.0	2.74	1.48	54	370
" " #5	"	87	1.9	2.76	1.49	54	392
" " #6	"	90	5.4	2.28	1.44	63	352
Red L. Ev. T272.1	"	81	10.0	2.82	1.52	54	664
Narrow Grain Evergreen - Variety							
Tri-State-Pack. Assn.	Hunter	90	.0	3.24	1.97	61	608
Watkins Pack. Co. A.	"	90	3.3	2.78	1.59	57	660
" " " B.	"	90	1.6	2.87	1.68	59	685
N. Grain Stock	C.A.E.S.	86	.0	2.81	1.54	55	469
Narrow Grain Evergreen - Hybrid							
251	G.M.S.	83	1.6	3.18	1.75	55	631
196	"	85 y	1.7	2.89	1.92	66	650
193	"	83	4.4	2.98	1.95	65	691
737 - 1	Ill. E. S.	83	1.8	2.28	1.13	50	500
759 - 1	"	86	1.6	3.02	1.41	47	657
749 - 1	"	86 y	.0	2.32	.98	42	528
728 - 1	"	86	2.0	2.72	1.12	41	507
T26.23	C.A.E.S.	83	.0	2.88	1.62	56	518
T26.8	"	78 y	.0	2.86	1.62	57	666
T 9.14	"	83	3.4	2.15	1.31	61	428
Country Gentleman - Variety							
Country G. Stock	C.A.E.S.	83	.0	2.80	1.70	61	594
Shoepeg (T.S.P.A.)	Hunter	90	2.0	2.13	1.35	63	515

Variety or Hybrid	Source of Seed	Days to Maturity [1]	Plants Dying Early Pct.	Yield per acre green Total Tons	Husked Marketable Ears Tons	Husked Marketable Ears Pct.	Husked Marketable Ears Doz.
Country Gentleman - Hybrid							
T19.15	C.A.E.S.	83	4.9	2.82	1.81	64	620
T20.34	"	81	1.5	2.07	1.28	62	463
T23.24	"	85	---	2.98	1.78	60	533
141	G.M.S.	81	3.3	2.71	1.58	58	624
137	"	81	1.5	2.43	1.38	57	592
Miscellaneous White							
McCullough's W.	White	90	2.0	2.23	1.13	51	505
Long Island Beauty	Landreth	90	.0	3.10	1.92	62	456
White Sunrise	"	81	6.8	2.36	1.35	57	476
Money Maker	"	87	3.2	3.27	1.80	55	629
Early Crosby	C.A.E.S.	74	2.6	1.03	--	--	--
Crosby Hybrids							
Crosby x Ev.77	"	78	9.3	1.86	--	--	--
T51.31	"	74	13.5	.89	--	--	--
T48.47	"	74	2.3	2.02	--	--	---
T 9.24	"	74	11.5	1.96	--	--	--
T273.1	"	74 y	11.1	2.34	--	--	--
Miscellaneous Yellow - Variety							
Golden Sunrise	Landreth	81	1.6	2.77	1.58	57	554
Bantam Ev. Stock	C.A.E.S.	78	3.2	1.66	--	--	--
Golden Bantam Stock	"	74	10.3	1.09	--	--	--
Miscellaneous Yellow - Hybrid							
57 (Golden C. B.)	G.M.S.	78	.0	3.14	--	--	769
53	"	78	3.4	2.67	--	--	783
65	"	78	.0	2.42	--	--	627
73	"	78	1.9	2.26	--	--	605
51	"	78	.0	2.99	--	--	920
Golden B. T27.26	C.A.E.S.	74 y	8.6	.89	--	--	--
" " T15,16	"	74	17.5	1.23	--	---	--
Bantam Ev. T24.7	"	83	3.2	2.22	1.32	60	396

[1] Harvested 17 - 18 days after one half of plants had silked.

y Harvested relatively young.

LIME FOR YOUR FARM

Questions and Answers

by

F. W. Oldenburg,
Extension Agronomist.

WHAT IS THE BEST KIND OF LIME TO BUY?

There is no best kind of lime. It is principally a question of cost and convenience. All kinds are equally good provided the farmer applies equivalent amounts, that is, amounts of liming materials in a finely pulverized condition, that carry equal number of pounds of available oxides. It is good business to buy that form of liming material which gives the greatest number of pounds of available oxides for the dollar.

WHAT IS MEANT BY EQUIVALENT AMOUNTS OF LIME?

Some forms of lime are more concentrated than others. For example, a good grade of lump or burned lime contains about 1900 lbs. of calcium oxide to the ton. A good grade of hydrated lime contains about 1500 lbs. and that of pulverized lime stone about 1100 lbs. to the ton.

Therefore, if a ton per acre of pulverized lime stone is recommended, an equivalent amount of hydrated lime would be about three fourths of a ton, and that of lump or burned lime would be about half a ton.

WHAT IS THE IMPORTANCE OF FINENESS?

Harmful soil acids exist largely as a part of the solids and of the colloidal matter in the soil. To neutralize these acids quickly it is therefore necessary to bring the lime to the acids, or in other words, to put the lime particles in contact with the acid particles. The lime will not act any great distance in any direction from the place it was put. The more thoroughly it is mixed with the soil the sooner the acid is neutralized.

Because hydrated lime is in such a finely pulverized condition is one of the chief reasons why this form of lime acts so quickly. Were pulverized limestone made equally fine, it would no doubt act as rapidly.

WILL FINELY PULVERIZED LIME STONE NEUTRALIZE MORE ACID THAN AN EQUAL AMOUNT LEFT IN A COARSE CONDITION?

For practical purposes, that is, for neutralizing the acid for the next crop, finely pulverized material will neutralize more acid than coarse material.

A certain amount of lime stone can neutralize a certain amount of acid. Grinding this rock does not add to nor detract from the total amount of acid it can neutralize. The finer material can however exert its full neutralizing power in a short time, that is, in a few days or weeks, while the larger particles may remain in the soil for years working very slowly.

IF ONLY A PART OF PULVERIZED LIME STONE OR SHELLS IS IN A FINELY PULVERIZED CONDITION, IS THE MATERIAL DESIRABLE?

Yes. In the case of nearby material, bought in bulk, with low hauling charges, such material may be the best buy as computed by the method given below. If however, the material lacks purity, contains much coarse matter, or has to stand high freight or hauling charges, it porbably will not be a good buy.

WHAT IS LIME MARL?

The lime marl found on the Maryland market is a precipitated form of calcium carbonate. It is found in large areas just beneath the surface, in the limestone valleys of Western Maryland and southward. Much of it is mixed with earth from above it. It has somewhat the consistancy of clay and dries in hard lumps. When finely pulverized by crushing the material has about the same value as pulverized lime stone of equal purity.

WHAT IS DOLOMITE LIME?

A lime is referred to as dolomite if it contains an appreciable amount of magnesium. To obtain the total oxides in this liming material the oxide of magnesium is added to that of calcium. Both are necessary plant food materials, and both neutralize acidity. While magnesium oxide is about one fifth more effective in neutralizing acids than an equal weight of calcium oxide, it is somewhat slower in action. Equal values are therefore given to the two.

IS BURNING NECESSARY TO MAKE LIME?

If for mortar or whitewash. Yes. If for neutralizing acids in the soil. No.

Soil acids are neutralized by the calcium and magnesium that are essential parts of limestone. To become effective it must be finely pulverized. This can be done in two ways.

(1) By grinding it to a powder by machinery.
(2) By burning and then slacking with water, producing hydrated lime.

Mixed with the moist soil, hydrated lime absorbs more water, combines with carbon dioxide from the soil and in a few hours to a few days, turns back like mortar, into calcium carbonate. In other words, it also becomes pulverized lime stone.

HOW CAN A FARMER DETERMINE WHICH OF SEVERAL LOTS OF LIMING MATERIAL WILL GIVE HIM THE MOST FOR HIS DOLLAR?

To determine this he will need the following information.

(1) The purity of each lot he is considering, expressed in total oxides.
NOTE. This and other necessary information regarding lime may be obtained by sending for the Report of the State Lime Inspection Service, College Park, Md. or by applying to the County Agent.
(2) In the case of pulverized lime stone and oyster shells he will have to know how fine they were ground. This is also given in the report.

(3) The cost per ton.
(4) The cost of freight per ton to his station.
(5) The cost of hauling is generally computed as 50¢ per ton for the first mile and 30¢ for each additional mile.

METHOD OF COMPUTING THE COST

The following is for illustration only and does not represent any actual prices.

We will assume that a farmer living 5 miles from a railroad station has two lots of pulverized lime stone under consideration both in 80 pound bags. One lot is offered for $6.15 and the other for $3.50 per ton delivered at the Station.

The State lime report gives the following information as to both chemical composition and the fineness of the two materials.

	Lot 1	Lot 2
Total oxides (Calcium plus magnesium oxides) ---	54.9%	45.3%
Per cent finer than 40 mesh ----------	100.0%	42.0%
Per cent between 40 and 20 mesh ----------	0.0%	35.0%
Per cent coarser than 20 mesh ----------	0.0%	20.0%

NOTE: In the case of these two liming materials full credit for fineness is given to all the part that will pass through a screen having 40 meshes to the inch. The part that will not pass the 40 mesh but will pass the 20 mesh is given half credit. The coarse material that will not pass through the 20 mesh screen is given no credit.

Computation for	Lot 1	Lot 2
Cost per ton at station ----------	$6.15	$3.50
Cost of hauling to the farm ----------	1.70	1.70
Total cost per ton ----------	$7.85	$5.20

Total oxides per ton 59.9% of 2000 or 1098 lbs.
Lot No. 2 43.3% of 2000 or 906 lbs.

Lot 1. Since $7.85 buys 1098 lbs. of oxides, one dollar will buy

1098 ÷ 7.85 or 139 pounds

Lot 2 gets credit for 42% plus half of 35%, a total of 59.5%
Total oxides is 906 pounds. Available 59.5% of 906 or 539 lbs.
One dollar buys

906 ÷ 5.20 or 104 lbs. of oxides.

That is, buying the first lot, he received 139 pounds for every dollar. Had he bought the second lot in spite of its apparent cheapness he would have received but 104 pounds of oxides for each dollar.

HOW ARE THE LIME NEEDS OF A SOIL DETERMINED?

Five kinds of tests are made on soil samples to determine their soil needs. These tests show:

(1) How sour the soil is, as indicated by the p.H value.
(2) The amount of lime needed as shown by the Comber or Thiocyanate test.
(3) The amount of soluble calcium present.
(4) The amount of soluble magnesium present.
(5) The amount of soluble aluminum present.

These five tests make it possible to make a good estimate of the lime needs. Numbers three and four are considered the most reliable. They show not only the lime needs but also the kind, that is, whether high calcium or dolomite.

Number five is a valuable additional test. In very acid soils, deficient in phosphorus and potash, soluble aluminum compounds may accumulate. When these reach a high or very high concentration they become toxic and slow up the growth of plants. If the concentration becomes high enough, growth may be prevented entirely. These poisonous compounds are precipitated and neutralized by liming and fertilizing.

Tests are also made to show the amount of soluble phosphorus, potash, and other plant food material in the soil.

HOW CAN A FARMER FIND OUT HOW MUCH LIME HIS SOIL NEEDS?

If a farmer suspects that any of his fields need liming, it is no longer necessary to guess. By taking a soil sample from the field and sending it or taking it to the County Agent, he will get this information. The County Agent will test it or have it tested at the University.

HOW IS A SOIL SAMPLE TAKEN?

A small amount of soil to a depth of about six inches is taken in a number of places in the field. After mixing well about a cupful is taken as the sample. If there are dissimilar areas samples should be taken of each. For cultivated land a garden trowel and a pan are all the tools needed.

When taking or sending a soil sample, certain information should go with it.

(1) What crop or crops are planned for the field.
(2) What crops were grown in recent years and what were the yields.
(3) What lime and what fertilizer has been applied in recent years.
(4) The kind of soil.

WHAT IS THE RELATIONSHIP BETWEEN THE KIND OF SOIL AND LIME NEEDS?

A heavy soil such as clay, rich in humus may contain several times as much acid per cubic foot as a like volume of coarse sandy soil deficient in humus. Under such circumstances a small application of lime on the sandy soil will cause as much change as a heavy application on the clay.

WHAT TERMS ARE USED TO EXPRESS THE DEGREE OF ACIDITY?

The p.H scale is used for this purpose. This scale is like a thermometer with the neutral point at 7 expressed as p.H 7.0. Figures above p.H 7.0 indicate that the soil has an alkaline reaction or an excess of lime. Smaller figures indicate acidity.

WHAT DEGREE OF ACIDITY WILL GIVE THE BEST PLANT GROWTH?

That depends upon the plants to be grown and other factors. In a general way the following table gives this relationship.

Soil Reaction and Plant Growth

Group Number	For Best Growth	Range	Lime Requirement	
	p.H	p.H		
I	7.0	6.0 to 8.0	Very High	Alfalfa, Sweet Clover, Beets.
II	7.0	6.0 to 8.0	High	Red Clover, White Clover, Barley, Asparagus, Celery, Onions, Spinach, Carrot, Cabbage, and related plants.
III	6.5	5.5 to 7.0	Medium	Corn, Wheat, Blue Grass, Soybeans, and most hay grasses.
IV	6.0	5.5 to 7.0	Low	Alsike Clover, Lespedeza, Buckwheat, Cowpeas, Lima Beans, Beans, Rye, Oats.
V	5.5	4.5 to 7.0	Very Low	Potatoes, Strawberries, Tobacco, Peanuts, Bent Grass, Watermelons.
VI	5.0	4.5 to 6.0	None	Laurel, Blueberries.

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HOW CAN A FARMER FIND OUT HOW MUCH LIME HIS SOIL NEEDS?

If a farmer suspects that any of his fields need liming, it is no longer necessary to guess. By taking a soil sample from the field and sending it or taking it to the County Agent, he will get this information. The County Agent will test it or have it tested at the University.

HOW IS A SOIL SAMPLE TAKEN?

A small amount of soil to a depth of about six inches is taken in a number of places in the field. After mixing well about a cupful is taken as the sample. If there are dissimilar areas samples should be taken of each. For cultivated land a garden trowel and a pan are all the tools needed.

When taking or sending a soil sample, certain information should go with it.

(1) What crop or crops are planned for the field.
(2) What crops were grown in recent years and what were the yields.
(3) What lime and what fertilizer has been applied in recent years.
(4) The kind of soil.

WHAT IS THE RELATIONSHIP BETWEEN THE KIND OF SOIL AND LIME NEEDS?

A heavy soil such as clay, rich in humus may contain several times as much acid per cubic foot as a like volume of coarse sandy soil deficient in humus. Under such circumstances a small application of lime on the sandy soil will cause as much change as a heavy application on the clay.

WHAT TERMS ARE USED TO EXPRESS THE DEGREE OF ACIDITY?

The p.H scale is used for this purpose. This scale is like a thermometer with the neutral point at 7 expressed as p.H 7.0. Figures above p.H 7.0 indicate that the soil has an alkaline reaction or an excess of lime. Smaller figures indicate acidity.

WHAT DEGREE OF ACIDITY WILL GIVE THE BEST PLANT GROWTH?

That depends upon the plants to be grown and other factors. In a general way the following table gives this relationship.

Soil Reaction and Plant Growth

Group Number	For Best Growth	Range	Lime Requirement	
	p.H	p.H		
I	7.0	6.0 to 8.0	Very High	Alfalfa, Sweet Clover, Beets.
II	7.0	6.0 to 8.0	High	Red Clover, White Clover, Barley, Asparagus, Celery, Onions, Spinach, Carrot, Cabbage, and related plants.
III	6.5	5.5 to 7.0	Medium	Corn, Wheat, Blue Grass, Soybeans, and most hay grasses.
IV	6.0	5.5 to 7.0	Low	Alsike Clover, Lespedeza, Buckwheat, Cowpeas, Lima Beans, Beans, Rye, Oats.
V	5.5	4.5 to 7.0	Very Low	Potatoes, Strawberries, Tobacco, Peanuts, Bent Grass, Watermelons.
VI	5.0	4.5 to 6.0	None	Laurel, Blueberries.

Cooperative Extension Work in Agriculture and Home Economics, Extension Service, Univ. of Md. and U. S. Department of Agriculture, Cooperating, Dr. T. B. Symons, Director.
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2/11/35

METHODS FOR DETERMINING LIME NEEDS

by

R. P. Thomas and F. W. Oldenburg

To determine the lime needs of soils, several methods are used. One method consists of determining the degree of acidity of a soil by one of several methods. Knowing the degree of acidity and the nature of the soil, the amount of lime needed can be computed. The degree of acidity is expressed on the pH scale. This scale is read like a thermometer, with the neutral point however at 7, expressed as pH 7.0. Figures above pH 7.0 indicate that the soil has an alkaline reaction or has an excess of lime, and is spoken of as a sweet soil. A reading, for example of pH 6.5 indicates a slight acidity only, a reading of pH 5.5 indicates that the soil is quite acid. Few samples from cultivated fields in Maryland show a reading much lower than pH 5.0.

Lime requirements change not only with the pH readings but also with the nature of the soil and the crops to be grown. For example, in testing several soils having the same pH reading, the recommendation for a heavy clay loam, high in organic matter, becomes less [redacted] for lighter soils. In the case of loamy sand or sand deficient in organic matter, only a quarter as much is required. While the recommendations based upon the pH readings are no doubt correct in the great majority of cases, on certain soils and on all soils under certain circumstances they may not be. For example:

(1) The pH test may show that a soil is only slightly acid, and would require little if any lime by this test. On the other hand this same soil may be so deficient in soluble calcium, or magnesium, or both, that it should receive lime to supply these plant foods.

(2) The pH test on sour soil may show that no lime is needed for a crop like potatoes. Yet this test would not show the soluble aluminum which may be so high as to be toxic. Thus a pH test above may not indicate the need of lime and fertilizer.

(3) The pH test may show that the soil is sweet or nearly so, yet it would not show the amount of soluble calcium and magnesium. Often times the amount of soluble calcium or magnesium is low enough to limit crop growth. In either case the deficient plant food should be supplied by applying a high calcium material for the deficient calcium or a high magnesia material for the deficient magnesium.

Therefore to make reliable tests for the lime needs of the soil, dependence cannot be put upon one test only. To be on the safe side, other factors must be known. For this reason, at the Maryland Experiment Station not only are the pH values determined, but the Comber test is used as a check, and also the amount of soluble calcium and soluble magnesium is determined, besides that of soluble aluminum compounds that become toxic when they are present in high concentration.

The Comber Test — The Comber or Thiocyanate test consists in adding some soil to a thiocyanate solution in a test tube. The greater the degree of acidity present in the soil sample, the redder the solution will turn. A color chart interprets the amount of lime needed.

There are therefore 5 tests for lime needs made at the Maryland Experiment Station which should give a safer picture of the lime needs of any soil than any one test alone would give.

When the Comber test for lime requirements reads less than 1,000 pounds per acre, there is doubt, when preparing the soil for ordinary field and garden crops, if it will pay to apply lime, unless (1) the Calcium (Ca) and Magnesium (Mg) readings are V. L. or less or (2) a crop having a high lime requirement is to be sown, such as alfalfa or sweet clover. When larger than 1,000 pounds per acre, the readings indicate the amount necessary for ordinary field and garden crops.

For alfalfa, sweet clover and other crops having a high lime requirement a larger application is needed, the amount depending upon the soil. On sandy soil low in organic matter only a slight increase is advisable. On heavier soils higher in organic matter more is necessary. On very heavy soils rich in organic matter, twice as much would be about right.

The need of liming is further indicated by the condition of the aluminum compounds. When soils become very sour and their supply of Calcium, Phosphorus, and Potash becomes very low, soluble aluminum compounds are set free. When these aluminum compounds reach a high or very high concentration they become poisonous to plants. Applying lime and fertilizer is the cure for this unfavorable condition for plant growth.

On light soils there is some danger of overliming.

The lime needs in the reports are given in terms of Calcium Carbonate, that is, pulverized lime stone, pulverized oyster shells, or lime marl. If hydrated lime, burned or lump lime were used, about two thirds as much of the former and one half as much of the latter would be equivalent amounts.

Calcium (Ca) and Magnesium (Mg) — Calcium and Magnesium are the two essential components of liming materials. Both neutralize soil acids and both are necessary plant foods.

Some soils, particularly those from the Eastern Shore and Southern Maryland though they be only slightly sour may still show a reading of V. L. or less for soluble Calcium and Magnesium, indicating the need of more lime particularly for crops having a high lime requirement.

While practically all liming materials supply enough both of Calcium and Magnesium for plant food needs on most soils, when the reading for soluble magnesium is V. L. or less while that of soluble calcium is considerably higher, the tests indicate the need of lime that contains enough magnesium to make up the deficiency.

Phosphorus (Phos) and Potash K_2O

These two plant foods are constituents of the rock particles and of the organic matter of which soil is composed. While the total varies widely, there is a large amount of both in soils but they are locked up in a form unavailable to plants and only a comparatively small amount is set free each year. On rich new soils high in organic matter the amount made soluble and useful to plants may be enough for the needs of a large crop. On the other hand, on thin soils low in organic matter only enough may be set free to supply a small growth. The difference between what the crop needs and what the soil can supply must be furnished by fertilization.

Readings of low (L) or less show a deficiency for the needs of a satisfactory crop, and the need of a fertilizer carrying the deficient plant food is indicated.

When both phosphorus and potash are required, they may be supplied by a mixed fertilizer, the mixture depending upon the crop to be grown, as for example, 0-12-5 for soybeans, a 6-6-5 for early potatoes and a 4-8-5 for late potatoes.

When building up soil fertility for a perennial crop such as alfalfa, when an application of phosphorus and potash may be made large enough to supply the crop for several years, there is little danger of loss, for phosphorus and potash stay pretty well where they are put, both working their way downward into the soil very slowly, the phosphorus slower than the potash and both slower in heavy soils than in sandy soils.

Nitrate Nitrogen (NO_3)
Ammonia (NH_3)

Nitrate nitrogen is the readily soluble form of nitrogen in the soil. It is also considered to be the most available for crop use. Unfortunately, it is easily lost from the soil by leaching. Consequently a slow test for nitrate nitrogen may not indicate a nitrogen deficiency. Nitrates are formed in the soil by microorganisms. The amount present in the soil depends upon the moisture content and temperature as well as the kind and amount of organic matter.

Since the ammonia form of nitrogen is one step in the change of organic nitrogen to nitrate nitrogen, it should not be present in large amounts in a normal soil. If the amount is high, it generally indicates unsatisfactory conditions for changing to the nitrate form. These conditions are probably poor drainage, or improper management of the soil. Of course the addition of ammonia in the fertilizer would give a temporarily high concentration of ammonia in the soil. The test for this form (NH_3) of nitrogen does not give the nitrogen requirement of the soil.

Manganese (Mn)
Aluminum (Al)
Chlorine (Cl)

A small amount of manganese is required as a plant food. When the concentration becomes High or V. H., it becomes toxic to the plants. On the other hand, when the reading for manganese is T. or O., it is possible that it indicates a harmful deficiency and the need for a small application of manganese sulphate.

Aluminum is not a plant food. When the soil becomes very sour and at the same time very low or less in its supply of phosphorus and potash, soluble aluminum compounds are set free. A high (H) or very high (VH) test for aluminum indicates the possibility of toxic aluminum that limits crop growth.

Chlorine (Cl)

The tests for chlorine are made to determine the presence of salt in the soil. A combination of high tide and strong wind sometimes leave fields along the shore flooded with salt water. A high (H) reading indicates a concentration damaging to crops.

Plant Foods

Nitrogen, phosphorus and potash are supplied by mixed fertilizers. The figures denoting the mixture show the per cent of units of each present. For example a 4-8-5 contains 4 per cent or four units or 80 lbs. of nitrogen in a ton, 8 per cent or eight units or 160 lbs. of phosphoric acid and five units or 100 lbs. of potash to a ton.

These three plant foods are also supplied by manure. A ton of average barn yard manure supplied only about 10 lbs. of nitrogen, 5 lbs. of phosphoric acid and 10 lbs. of potash. While the composition of all manures varies greatly, in the case of fresh poultry manure a ton supplies about twice as much nitrogen and phosphorus as average barnyard manure.

Manure, however, supplies not only the three plant foods mentioned, but may supply small amounts of other plant foods that may be necessary, but more important, it brings much needed organic matter to soils. Not only is it a source of plant food and of organic matter but it supplies and promotes the growth of useful soil organisms, stimulates crop growth and brings about a condition more favorable for the release of plant foods from the soil.

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Cooperative Extension Work in Agriculture and Home Economics, Extension Service, University of Maryland, and United States Department of Agriculture, Cooperating

T. B. Symons, Director

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350128

STATE SHOWS INCREASE IN PRODUCTION OF CERTIFIED WHITE SEED POTATOES

Maryland was included among twelve States reporting a larger yield of certified seed potatoes in 1934 than in 1933. According to Dr. R. A. Jehle, plant pathologist for the University of Maryland Extension Service, a total of 94,712 bushels of seed were eligible for certification in this State last year as compared with 72,572 bushels in 1933. Stated in acres inspected, in 1933 more than 535 acres received inspection whereas the year following this number was increased to 764 acres.

Of the varieties certified in Maryland during the past year Irish Cobblers lead with a total of 55,312 bushels as compared with 25,968 bushels certified in 1933. Next in order were Smooth Rurals with 25,000 bushels in 1934 compared with 21,542 bushels in 1933. Jersey Redskins or Dakota Reds increased from 3,773 bushels to 6,150 bushels, and McCormicks showed an increase to 287 bushels in 1934 from 49 bushels the year before. Because of disease the number of bushels of Russet Rurals, certified in 1934, was only 6,500 bushels as compared with 20,602 bushels the year before.

Other varieties inspected during the year included Katahdin, Green Mountain, Bliss Triumph, Up-To-Date, Spaulding Rose, and Chippewa. Certification in none of these varieties went above 1,500 bushels although most of them showed a decided increase over last year.

Any grower interested in securing Maryland grown certified seed potatoes should get in touch with his local county agent or Dr. Jehle at College Park, either of whom will gladly furnish a list of producers names, free of charge.

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TOMATO SEED CERTIFICATION REGULATIONS

Maryland Seed Certification Board

Extension Service
University of Maryland.

The objects of tomato seed certification in Maryland are:

1. To produce tomato seed that is free from varietal mixture, true to type, and reasonably free from diseases.

2. To promote the use of high grade tomato seed as a means of production of larger yields per acre and better quality raw stock.

CERTIFICATION PROCEDURE

1. Application:- Application for certification must be made in writing to the Maryland Seed Certification Board, University of Maryland, College Park, Maryland, at least thirty days prior to the time of first harvest. The application will not be considered unless the stock seed of the applicant was produced in accordance with the requirements hereinafter stated.

Formal application for certification shall be understood to mean that the applicant is familiar with and will abide by the regulations as set forth herein. Application shall be made on the form provided, which shall remain attached to the copy of regulations.

2. Charges for Field Inspection:- An initial fee of $10.00 must accompany the application. A subsequent charge of $5.00 per acre shall be made for inspection, except that the applicant shall have the privilege in lieu thereof of paying the actual travel costs of inspection as submitted by the field inspector. Seed will not be certified until this charge is paid. No charge, other than the initial fee, will be made for inspection of acreage that is disqualified at the first inspection.

3. Field Inspections:- At least one inspection will be made of the field and the seed improvement plot during the growing season, preferably just prior to the first picking. Such additional inspections may be made as deemed desirable by the inspector.

4. Charges for Plant Inspection:- The applicant shall guarantee in advance the cost of maintaining a Federal-licensed representative of the Maryland Seed Certification Board at the point of seed saving during the seed-saving period. Charges for this inspection shall be made at the prevailing salary rate for such representatives. The duties of this representative shall be to see that the requirements of the Seed Certification Board are carried out.

5. Certification:- Final decision as to certification shall be made in every case by the Maryland Seed Certification Board. This Board shall settle any points of controversy not covered by written regulations.

If, after drying and cleaning, the seed is eligible for certification, it shall be placed in a container or containers, subject to the approval of the inspector, and sealed in his presence with the official seal and tag of the Maryland Seed Certification Board. In the event that the applicant wishes to dispose of the seed in small packets, the Board will

cooperate to this end. Such provisions must of necessity be flexible and adjusted to apply to the conditions involved.

6. Seed Samples:- Samples of all seed which is officially certified may be required of the applicant without charge by the inspector for testing in such a manner as to determine the quality of the seed. If the quality of this seed does not meet the approval of the Board, further certification will be denied until the conditions responsible for the inferior quality are remedied.

7. Sales Records:- The applicant will be required to furnish the Board a complete report of all sales and deliveries of certified seed.

8. Violations:- Any willful misrepresentation or infringement by the applicant to defeat the purposes of certification shall be considered in violation of the agreement and further certification will be denied.

9. Responsibility:- The Maryland Seed Certification Board will not assume any responsibility under contracts between producers and purchasers of certified seed nor for any losses that may result from the use of such seed.

STANDARDS FOR CERTIFICATION

1. Stock Seed:- Each applicant will be required to give information as to the source of the original seed stock. Fields will not be considered for certification unless planted with seed which has been selected in conformity with the following two-generation plan. Seed of the first generation shall be saved in separate lots from hill-selected plants, the type of which must be satisfactory to the inspector of the Maryland Seed Certification Board. For the second generation, seed of the individual plant selections shall be planted in hill-row progeny tests. All off-type plants and selections shall be rogued from the plot. Seed from the remainder of the plot may be used for planting the commercial seed acreage the following year.

Applications for certification will not ordinarily be accepted unless the stock seed was produced in Maryland according to the above plan and under the observation of an inspector of the Maryland Seed Certification Board. Under certain conditions, seed produced outside of the State may be accepted if positive proof can be shown that it was selected in conformity with the above plan and is of the type and quality acceptable to the Board.

2. Varieties:- Only those varieties will be considered for certification which are recommended by the vegetable specialists of the University of Maryland and which have sufficiently distinct characteristics to make identification possible.

Where more than one variety is grown, the applicant must provide adequate facilities and take the necessary precautions in the growing and handling of the fruit and seed to prevent mixtures. Fields will not be accepted for certification if other tomatoes are grown on the same farm which are not entered for certification.

Fields will be disqualified which show at picking time varietal mixture in excess of one tenth of one per cent (0.1%). Fields may be disqualified if in the mind of the inspector a sufficient number of plants are not true to type for the variety. Where applicable, the description given in U.S.D.A. Miscellaneous Publication No. 160 will be followed for

type determinations. Varietal mixtures and off-type plants may be rogued from the field prior to the first harvest.

3. Isolation:- Both the seed field and the seed plot must be sufficiently isolated from all other tomatoes to minimize the possibility of natural crossing. A field may not be considered for inspection unless these conditions meet with the approval of the inspector.

4. Diseases:- Fields known to be infested with Fusarium wilt will not be considered for inspection.

Fusarium wilt must not exceed 1-1000 at the time of first harvest.

No tolerance is allowed for bacterial canker. Fields showing any plants affected with this disease will be disqualified.

Fields must at all times be reasonably free of other seed-borne diseases. Certification may be discontinued on any part of a crop if leaf diseases or other conditions reduce the vitality of the plants to a point where the seed might be of inferior quality.

5. Seed Treatment:- Treatment of the seed with a fungicide is not generally a requirement for certification. However, if leaf blights and other externally seed-borne diseases become sufficiently serious the inspector may require treatment of the remaining portion of the crop or discontinue certification.

6. Cultural Conditions:- Fields will be disqualified if they are neglected and so weedy that satisfactory inspection is difficult.

7. Germination:- Seed to be eligible for certification must show a germination satisfactory to the Seed Certification Board, as reported by the Maryland Seed Laboratory.

8. General:- The field may be disqualified at any time for any other disease, insect or condition which in the judgment of the inspector may be of sufficient importance to disquality it.

LABELING

Tags, seals, and labels will be furnished by the Maryland Seed Certification Board at cost.

1. Bags:- Certified seed marketed in individual containers of more than one pound shall bear the tag and seal of the Maryland Seed Certification Board. The tag shall contain the following information:

a. Front

MARYLAND
CERTIFIED TOMATO SEED
Crop of 19__

Maryland Seed Certification Board

Name of Producer_____

Address_____

Certificate No._____Variety_____

Germination satisfactory to the Maryland Seed Certification Board.

b. Back

This certified tomato seed has been inspected under the direction of the Maryland Seed Certification Board and has been found to be practically free from serious diseases and varietal mixture.

The seedsman guarantees this seed to be part of that inspected and certified.

The Maryland Seed Certification Board specifically disclaims all responsibility for any financial claim arising between vendor and vendee of seed to which this certificate is attached.

2. Small Packets:- Seed marketed in packets of one pound or less shall carry the official adhesive label of the Maryland Seed Certification Board. This label shall be affixed in such a manner that either it must be broken or the container damaged in opening the packet. The lable shall carry the following information:

CERTIFIED TOMATO SEED
Maryland Seed Certification Board
University of Maryland
College Park

This seed has been inspected and certified by the Maryland Seed Certification Board. The seedsman guarantees this seed to be part of that certified.

The Maryland Seed Certification Board specifically disclaims all responsibility for any financial claim arising between vendor and vendee of seed to which this certificate is attached.

Effective date:
April 13, 1934

S. B. Shaw, Chairman
Maryland Seed Certification Board

THE MARYLAND STATE DEPARTMENT OF MARKETS
SEED CERTIFICATION

Application and Agreement for Certification of Tomato Seed

For certification in accordance with rules and regulations prescribed by the Maryland Seed Certification Board, University of Maryland, and the Maryland State Department of Markets, _____ _____ hereby makes application of the Maryland State Department of Markets for inspection and certification of tomato seed at _____.

The Maryland State Department of Markets agrees to assign to the service of the applicant a competent Federal-licensed inspector during the seed-saving season beginning approximately _____.

The applicant agrees to pay to the Maryland State Department of Markets the sum of _____ dollars per week for each inspector assigned. The first weekly payment to be made before or at the time of the signing of the contract, and on a weekly basis thereafter at the end of each calendar week, during the life of this contract, accounting from the date the inspector is actually assigned to said applicant. Where the applicant desires the inspector to visit growers or make inspections at some point other than that at which the inspector is regularly located, it is understood that the applicant will reimburse the Maryland State Department of Markets for the additional expense incurred at the rate of _____ per mile, payable at the end of each calendar week.

The applicant especially and particularly agrees to assume financial liability for not less than " _____ weeks' continuous employment of each inspector assigned

_____
Applicant

_____
Address

_____
Maryland State Department of Markets

Date _____ By _____

1935

1934 Potato Improvement Program

I. Seed Stock Development, Improvement and Maintenance.
The object of this work is to determine the most satisfactory and profitable methods for developing, improving and maintaining potato seed stocks in Maryland.

A. Control of virus and other seed borne diseases conducted by the Department of Pathology.

1. Tuber Index Work.
Studies will be continued to determine how much the amount of virus and other seed borne diseases can be reduced by tuber indexing.
   a. Stock will be indexed on the Eastern Shore and multiplied there.
   b. Stock will be indexed on the Eastern Shore and multiplied in Garrett County.

2. Tuber Unit Work.
Studies will be continued to determine how much the amount of virus and other seed borne diseases can be reduced by tuber uniting and by tuber uniting following tuber indexing.
   a. Garrett County tuber unit plots.
   b. Eastern Shore tuber unit plots.
   c. 4-H club members' tuber unit plots.

B. Improvement by breeding.
The Department of Horticulture cooperating with the U. S. Department of Agriculture is developing disease resistant commercial varieties for:-
1. Mountain, Piedmont and early crop sections.
2. Late and second crop planting.

C. New Varieties and selections will be given preliminary tests by the Department of Horticulture and the most promising will be released for increase and wider tests.

D. Comparison of seed stocks and varieties from various sources.
This work is being conducted by the Department of Plant Pathology to determine which varieties and seed stocks can be most profitably used for planting potatoes in different parts of the State for the early, early harvested late and late potato crops.
1. Seed source plots in Worcester County.
2. Seed source plots in Garrett County.
3. Seed source plots in Frederick County.

E. Recommendations.
1. Maryland grown certified seed is recommended for planting the potato crop in all parts of the State for the early, early harvested late and late potato crop.

2. The following varieties have given good results in Maryland:
   a. Early: Irish Cobbler
   b. Early harvested late: Russet Rural, Smooth Rural, Green Mountain, Spaulding Rose, and Katahdin.
   c. Late:
      (1) Kept in home storage: Dakota Red (Jersey Redskin) and McCormick.
      (2) Kept in cold storage after March 1st:
         (a) Seed Stock: Irish Cobbler, Dakota Red (Jersey Redskin)
         (b) Commercial: Dakota Red (Jersey Redskin), Green Mountain, McCormick, Up-To-Date (Scotch Rural, White Star, Gold Coin, Spencer) and Katahdin.

II. Seed Certification

A. Work with growers of registered seed.
Growing of registered seed will be supervised and registered seed growers will be assisted in securing seed and in planting and roguing their fields.

B. Work with growers of certified and listed seed.

1. Field and bin inspections will be made and the grower will be instructed in disease and insect detection, roguing and other disease and insect control measures.

2. The value of Maryland grown certified seed will be demonstrated in various parts of the State using the following seed stocks: Mountain grown and second crop Irish Cobblers, Mountain grown Smooth Rurals and Russet Rurals and Green Mountain, Mountain grown and second crop Katahdin, Eastern Shore grown McCormicks and Eastern and Western Shore grown Dakota Red (Jersey Redskin)

3. A list of certified seed growers will be mimeographed for distribution.

III. Seed and Soil Treatment.

Recommendations: Seed treatment with bichloride of mercury or organic mercury is recommended when Scab and Rhizoctonia are present on the seed to prevent loss and waste by controlling these diseases which when present disqualify potatoes from meeting standard grade requirements.

IV. Fertilizers and Cultural Practices.

A. Time of planting experiments will be conducted by the Department of Horticulture to observe the most favorable planting conditions for spring and second crop planting.

B. Fertilizer and rotation experiments will be conducted by the Departments of Agronomy and Horticulture.

C. Crop rotation, cover crop, and liming demonstrations to show the value of proper rotations and the use of cover crops in the control of soil borne diseases and to show that properly limed legumes can be included in the rotation without increasing the amount of scab infection on the tubers.

D. Recommendations.

1. Early potato fertilizer analysis 6-6-5 made up of 20% organic nitrogen and the remainder from sodium nitrate and ammonium sulphate. The potash to be preferably muriate. Rate of application 1,000 to 2,000 pounds per acre depending upon the soil type and location.

2. Early harvested late potato fertilizer analysis 4-8-7. Rate of application, 500 to 600 pounds per acre on land having manure and legumes turned under and 700 to 800 pounds per acre on land without manure and legumes. A 4-12-4 may be used on soils normally high in potash.

3. Late potato analysis (for potatoes planted after July first) 2-9-5 or 2-12-4 on fertile soil that has been manured and 6-6-5 on soil low in fertility, rate of application 600 to 800 pounds per acre.

V. Spraying and Dusting.

A. Tests will be conducted by the Departments of Plant Pathology and Entomology to determine the relative merits of calcium arsenate, sal soda Bordeaux with calcium arsenate and Bordeaux calcium arsenate. and basic copper sulfate with arsenate of lead.

1. Spraying tests in Worcester County early crop.
2. Spraying tests in Worcester County late crop.
~~3. Spraying tests in Frederick County.~~
3. Spraying tests in Garrett County.

Recommendations: A regular spraying program with 4-4-50 Bordeaux mixture with the addition of two pounds of arsenate of lead, or calc ars. is recommended in all parts of the State, spraying to begin when the vines are about six inches high and continuing at ten day to two week intervals. If flea beetles are severe or weather conditions are favorable for Late Blight, applications should be more frequent. Dusting has not given as good results as spraying and is recommended only when conditions make it too costly or difficult to spray.

VI. Boys' Club Work. The value of boys' potato clubs in introducing improved practices in potato culture into the community and their educational value have been demonstrated in Garrett County, and the organization of such clubs will be encouraged in other counties.

A. Potato Production Clubs.

Potato production clubs will be organized in Garrett and Prince George's Counties and in all other parts of the State where potatoes are grown. The object of these clubs will be to teach boys how to grow the largest yields of high quality potatoes at the lowest cost and to teach the boys how to produce certified seed potatoes when conditions are not favorable for maintaining a seed plot,

B. Tuber Unit Certified Seed Potato Clubs.

Tuber unit certified seed potato clubs will be organized in Garrett County and Prince George's County and in other seed potato producing counties. All boys who intend to become certified seed potato growers should be encouraged to join one of these clubs. Boys who do not intend to become seed potato growers should be encouraged to join these clubs to get the benefit of their educational value.

VII. Marketing.

The Potato Improvement Committee endorses the activities of the Inter-State Potato Committee.

The Committee recommends that growers place on the market only such lots of potatoes as meet U. S. grade requirements, particularly U. S. No. 1.

It is suggested that in the larger commercial areas, potato grading demonstrations be conducted with both distributing agencies and producers during the shipping season. Method demonstrations of this character can be conducted in conjunction with federal state shipping point inspection.

It is further recommended that the use of federal state shipping point inspection be encouraged whenever the service is available.

The Potato Improvement Committee recommends the organization of certified seed potato growers' cooperatives, especially in Garrett and Worcester Counties for the purpose of producing, advertising and marketing a uniform grade of high quality certified seed potatoes.

VIII. Publicity.

A. Exhibits. Sponsored by Vegetable Growers' Association. The following shows will have a certified seed class and also commercial and 4-H classes if possible.

1. Eastern Shore group - all Eastern Shore counties.
2. Western group - Garrett and Allegany Counties.
3. Annual Exhibit - open to all certified seed growers.

commercial and

B. Tours and Field Meetings.

1. A field meeting which will be conducted in Worcester County will be part of a series of tours beginning at Virginia and ending at Long Island.

2. Tours and field meetings will be conducted whenever the county agent feels that the potato growers will be sufficiently benefited for the time and effort spent.

3. Press Publicity.

4. Circular Letters.

5. Posters and Charts.

6. Window Exhibits to Show Results of Demonstrations and Boys' Club Work.

7. Circulars to be Published on Results of Experiments and Demonstrations.

8. Film strips and Lantern slides.

9. Method Demonstrations.

10. Result Demonstrations.

Potato Improvement Committee

R. A. Jehle, Specialist in Pathology.

T. H. White, Olericulturist, Maryland Experiment Station.

J. E. Metzger, Agronomist, Maryland Experiment Station.

S. B. Shaw, Chief, State Department of Markets.

R. T. Grant, County Agent, Worcester County.

J. H. Carter, County Agent, Garrett County.

E. G. Jenkins, State Boys' Club Agent.

E. N. Cory, State Entomologist.

W. R. Ballard, Specialist in Vegetable Gardening.

J. H. Beaumont, Head, Department of Horticulture, Univ. of Md.

1/26/34
MLO

MAKING ARTIFICIAL MANURE FOR THE HOME GARDEN

By
F. W. Oldenburg,
Extension Agronomist

Locate a compost heap in some secluded place. It may be built up on the surface of the soil, but it is better to have a pit a foot or two deep, preferably lined with cement. A good size for the home garden is 4' x 4'. It is best to have two such pits.

A compost heap may be started at any time of the year. Any organic matter may be used such as lawn clippings, leaves, weeds, waste vegetable parts, kitchen scraps and old straw and hay. If there is not enough material of this kind, a bale of peat moss will supply the deficiency. It is best to have two pits, owing to the fact that after building up a heap it takes about two months even in warm weather to complete the process; a new heap may be started in the meanwhile.

The compost heap should be built up evenly with a flat top so that it will catch all the rain possible. In dry weather it should be watered liberally and care taken to compact any loose material like leaves.

When the heap has attained a depth of at least a foot, lime at the rate of three to four pounds should be sprinkled over it. Hydrated lime and pulverized lime stone will be found convenient material. The former can be bought locally in fifty-pound bags and the latter in eighty-pound bags. After liming, an even layer of good top soil about an inch deep should be applied. Fertilizer should be sprinkled evenly over this soil. Four or five pounds of a complete fertilizer rich in nitrogen is suggested, such as a 7-6-5 or similar fertilizer usually used for early potatoes.

At least four or five such layers should be built up till the heap attains a thickness of about three feet. When it has reached the desired depth, it should be allowed to stand for several weeks, meanwhile starting another heap. It should then be forked over thoroughly. The forking should be repeated several times at intervals of two or three weeks, till the coarse material is well broken down. Keeping the heap moist and compact will hasten the process.

Cooperative Extension Work in Agriculture and Home Economics, Extension Service, University of Maryland and the U. S. Department of Agriculture, Cooperating.
T. B. Symons, Director.
(Distributed in furtherance of Acts of Congress of May 8 and June 30, 1914).

COOPERATIVE EXTENSION WORK
INTERSTATE EARLY POTATO COMMITTEE
COOPERATIVE INSTITUTIONS

U. S. Department of Agriculture
Bureau of Agricultural Economics
Extension Service
North Carolina State
Department of Agriculture

Agricultural Extension Service
Virginia
North Carolina
South Carolina
Maryland
Florida

Washington, D. C.

MARCH 1935 REPORT
INTERSTATE EARLY POTATO COMMITTEE

There are attached to this report eleven tables containing much of the information that has been requested by persons interested in studying the effect of the proposed Potato Control legislation on the potato situation of their State. These tables may help as a guide in making such studies. Not all the information desired is available. We are indebted to Dr. O. E. Baker and Paul L. Koenig of the Bureau of Agricultural Economics for this material.

The percent sold or for sale as indicated in tables II and IV are State averages. The county averages in some States range from less than 10 percent sold to over 90 percent sold, the higher averages prevailing in those counties where production is primarily for commercial sales purposes and shipment to market.

EASTERN SHORE POTATO PRODUCTION CREDIT AGREEMENT

This agreement sponsored by the industry interested in potato production financing has functioned better than was previously expected. The financing agencies have cooperated and effected an adjustment in the potato acreage on the Eastern Shore. The March intention to plant report indicates a decrease of 18 percent or the intention to plant 41,800 acres compared with 51,000 planted in 1934. The administrators of the agreement predict a 20 percent acreage decrease. The planting of 40,000 acres was recommended by this committee. The intended reduction on the Eastern Shore of Maryland is 7 percent, or 3 percent less than that recommended.

The Potato Control Bill, H. R. 6082 is in the sub-committee of the House Committee on Agriculture and Forestry.

About five days were spent in the field: One day in traveling, two days in Maine, one in New York, and one in New Jersey.

A meeting at Orono, Maine, attended by about 50 potato growers and members of the Maine Extension Service, was participated in. The proposed changes in the Potato Control Bill were discussed and explained.

Conferences were held at New York City with agencies marketing potatoes.

Conferences were held at New Brunswick, New Jersey, to obtain information regarding the marketing of the 1933 and 1934 New Jersey potato crops.

Respectfully submitted,

A. E. Mercker,
Agent, U. S. Department of Agriculture,
and
Secretary, Interstate Early Potato Committee.

Table I

Irish Potatoes: Number Farms Reporting, Acreage, Production, and Counties Reporting for 1929 /1, Number Counties Shipping Potatoes for 1928.

State	Number Farms Reporting Farms 1	Acreage Acres 2	Production Bushels 3	Number Counties Reporting Counties 4	Number Counties Shipping by Rail Counties 5
Maine	27,688	162,396	47,441,580	16	7
New Hampshire	9,504	7,179	1,030,327	10	2
Massachusetts	11,785	9,719	992,273	14	1
Rhode Island	1,756	1,865	237,056	5	1
Vermont	17,186	13,874	1,727,684	14	6
Connecticut	9,416	9,670	1,132,621	8	-
New York	115,606	212,400	21,445,436	58	24
New Jersey	9,097	36,963	4,733,520	20	5
Pennsylvania	132,120	193,426	20,756,447	67	29
Ohio	138,581	104,490	10,031,954	88	7
Indiana	100,786	49,642	4,145,446	92	3
Illinois	128,459	46,721	3,920,986	102	4
Michigan	123,937	223,794	15,911,808	83	47
Wisconsin	152,598	215,154	20,589,825	71	48
Minnesota	147,777	329,598	25,416,966	86	51
Missouri	153,664	49,863	3,926,305	115	7
Iowa	151,088	76,885	7,613,682	99	14
North Dakota	55,905	121,052	6,695,416	53	30
South Dakota	52,716	55,940	4,169,943	59	12
Nebraska	91,173	100,908	9,350,327	94	20
Kansas	87,655	42,310	3,770,263	105	9
Montana	21,687	20,673	1,842,812	56	19
Idaho	15,406	76,609	14,304,596	44	28
Wyoming	6,875	19,932	1,834,305	23	10
Colorado	15,043	89,692	14,649,446	62	24
New Mexico	1,444	4,097	318,991	24	2
Arizona	605	1,807	156,642	14	2
Utah	8,506	10,798	1,975,277	29	9
Nevada	1,057	3,692	541,559	17	5
Washington	28,768	43,908	7,188,337	39	14
Oregon	22,557	33,039	3,364,289	36	15
California	6,394	31,658	6,489,203	58	17
Maryland	29,755	29,958	3,366,152	24	5
Delaware	6,755	4,234	340,738	3	2
District of Columbia	39	61	3,973	1	-
Virginia	114,740	102,656	15,244,216	115	10
West Virginia	69,086	35,924	3,745,941	55	6
North Carolina	132,771	61,507	6,072,709	100	24
South Carolina	32,422	20,323	2,580,248	46	15
Georgia	49,682	12,952	879,618	161	4
Florida	7,113	23,460	2,714,323	65	24
Kentucky	136,618	49,250	4,651,948	120	2
Tennessee	129,948	38,651	3,129,990	95	6
Alabama	66,431	21,256	1,609,525	67	7
Texas	97,399	39,786	2,773,216	244	17
Mississippi	39,345	9,045	697,617	82	4
Oklahoma	85,488	38,564	2,904,666	77	14
Arkansas	101,154	29,215	2,516,745	74	12
Louisiana	36,092	27,466	1,478,967	63	19
Total	2,982,677	2,944,082	322,365,914	3,053	643

/1. Source of Information: 1930 Census, Agriculture Volumes II, Parts, 1, 2, and 3.
9897.

Table II

IRISH POTATOES: 5-Year Averages of Yield Per Acre
1900-04 to 1930-34 /1

Bushels

State	1900-04	1905-09	1910-14	1915-19	1920-24	1925-29	1930-34 /2
Maine	151	192	228	185	239	255	272
Idaho	119	146	151	163	185	197	217
California	129	140	137	133	156	180	210
New Jersey	118	117	131	145	132	141	180
New Hampshire	112	122	136	108	123	126	176
Rhode Island	128	125	133	116	120	122	173
Connecticut	102	108	105	99	115	115	167
Washington	126	130	126	120	160	173	163
Massachusetts	102	107	117	106	119	103	152
Vermont	120	122	131	102	127	118	152
Utah	157	156	144	153	156	153	138
Oregon	93	103	98	93	105	113	139
New York	88	96	108	95	119	108	135
Nevada	171	160	147	142	146	145	127
Pennsylvania	85	88	93	85	101	114	125
Colorado	102	118	106	144	135	165	124
South Carolina	94	92	85	98	120	120	119
Virginia	88	101	98	124	116	134	114
Florida	72	87	93	100	96	118	106
North Carolina	76	78	70	90	95	96	102
Michigan	93	92	105	77	105	99	96
Maryland	85	94	88	107	99	110	95
Ohio	91	91	84	72	85	98	93
Wisconsin	94	103	116	94	104	104	89
Delaware	92	95	89	92	84	90	88
Montana	137	149	143	136	110	107	88
Wyoming	105	114	88	102	98	110	86
Indiana	73	77	70	64	81	90	84
Kansas	67	70	51	61	79	102	82
Alabama	73	78	70	68	77	72	81
Arizona	52	79	84	82	81	70	80
New Mexico	66	78	60	65	48	72	76
Arkansas	69	73	59	69	68	72	75
Minnesota	92	109	103	90	95	96	74
Oklahoma	78	76	61	69	67	74	74
West Virginia	81	89	70	91	98	102	74
Iowa	82	93	78	75	94	90	73
Missouri	75	82	58	71	79	84	73
Mississippi	72	78	75	75	73	70	72
Kentucky	77	86	63	82	81	90	70
Texas	67	70	61	64	61	68	71
Illinois	80	81	64	74	75	84	68
Tennessee	67	73	58	71	71	74	67
Louisiana	66	65	59	64	61	58	63
Nebraska	70	75	59	70	84	85	64
Georgia	79	76	69	66	67	62	63
North Dakota	92	97	89	75	84	80	61
South Dakota	78	80	63	68	82	85	49
United States	90	98	100	94	108	114	109

/1. Ranking according 1930-34 5-year average
/2. Preliminary

9897

TABLE III.

FARM VALUE, GROSS INCOME AND CASH INCOME FROM FARM PRODUCTION
POTATOES (white), 1932 CROP /1.

State	Production			Disposition						
	Total	Left in ground	Having value	Unfit for food or seed	Shrinkage	Used for seed	Fed to Livestock	Home Consumption	Sold (or for sale)	Percent sold or for sale
	1,000 bushels									
Me.	40,460			2,428	683	2,396	405	1,062	33,486	82.76
N. H.	1,320			40	9	86	-	262	923	69.92
Vt.	2,320			162	13	227	-	629	1,289	55.56
Mass.	1,950			58	15	69	-	324	1,484	76.10
R. I.	320			16	-	4	-	44	256	80.00
Conn.	1,980			59	16	30	-	252	1,623	81.96
N. Y.	28,350			1,701	606	2,626	1,009	3,840	18,568	65.49
N. J.	7,155			72	-	150	-	324	6,609	92.36
Pa.	21,450			858	538	2,950	269	4,200	12,635	58.90
Ohio	11,583			463	124	1,258	-	3,675	6,063	52.34
Ind.	5,490			220	20	579	-	2,675	1,996	36.35
Ill.	4,860			194	22	387	-	3,192	1,065	21.91
Mich.	29,900			2,093	592	3,314	1,585	4,160	18,156	60.72
Wis.	22,620			2,262	595	2,998	821	5,236	10,708	47.33
Minn.	29,562	591	28,971	2,956	758	4,099	3,289	5,580	12,289	41.57
Iowa	8,140	-	-	488	137	805	-	4,104	2,606	32.01
Mo.	5,600	-	-	224	38	341	-	3,140	1,857	33.16
N. Dak.	9,338	280	9,058	1,027	211	1,670	982	1,860	3,308	35.42
S. Dak.	5,110	-	-	358	102	846	296	1,710	1,798	35.18
Nebr.	8,775	176	8,599	790	110	1,109	383	3,104	3,103	35.36
Kans.	5,148	-	-	257	56	178	-	1,932	2,725	52.93
Del.	516	-	-	10	-	36	-	172	298	57.75
Md.	2,852	-	-	86	-	218	-	682	1,866	65.42
Va.	9,682	-	-	290	-	376	-	2,070	6,946	71.74
W. Va.	3,485	-	-	174	-	414	-	1,825	1,072	30.76
N. C.	6,596	-	-	132	-	133	-	2,603	3,728	56.51
S. C.	1,445	-	-	43	-	29	-	300	1,073	74.25
Ga.	1,003	-	-	50	-	34	-	530	389	38.78
Fla.	1,541	-	-	31	-	2	-	64	1,444	93.70
Ky.	4,620	-	-	139	-	394	-	2,698	1,389	30.06
Tenn.	3,657	-	-	146	-	314	-	2,622	575	15.72
Ala.	2,484	-	-	75	-	54	-	900	1,455	58.57
Miss.	980	-	-	49	-	25	-	630	276	28.16
Ark.	2,627	-	-	158	-	92	-	1,696	681	25.92
La.	2,160	-	-	65	-	82	-	756	1,257	58.19
Okla.	3,108	-	-	124	-	138	-	1,479	1,367	43.98
Tex.	4,154	-	-	125	-	86	-	1,760	2,183	52.55
Mont.	2,244	-	-	180	37	267	104	805	851	37.92
Idaho	19,800	396	19,404	1,584	488	1,319	847	462	14,704	74.26
Wyo.	1,485	59	1,426	89	17	345	-	225	750	50.50
Colo.	11,000	-	-	1,430	216	1,409	622	418	6,905	62.77
N. Mex.	510	-	-	26	-	68	-	52	364	71.37
Ariz.	270	-	-	8	-	24	-	28	210	77.77
Utah	2,250	-	-	90	54	130	36	240	1,700	75.55
Nev.	300	-	-	9	12	24	-	24	231	77.00
Wash.	6,400	128	6,272	512	283	410	-	756	4,311	67.35
Oreg.	5,040	-	-	454	105	474	-	598	3,409	67.63
Calif.	6,369	-	-	382	110	349	-	158	5,370	84.31
U. S.	358,009	1,630	356,379	23,187	5,967	33,368	10,648	75,858	207,351	57.91

/1. Source of Information: Report of August, 1934, issued by the Division of Crop and Livestock Estimates, Bureau of Agricultural Economics, U.S.D.A.

Note:- This income statement is considered to be reasonably indicative of the approximate sales of potatoes for each State during this crop year. The data are preliminary and subject to more interpretation, analysis, and revision before it can be brought into complete conformity with the basic provisions of the proposed potato bill as finally drafted, if passed.

TABLE IV.

FARM VALUE, GROSS INCOME AND CASH INCOME FROM FARM PRODUCTION
POTATOES (white), 1932 CROP /1

State	Farm Price	Farm Value	Gross Income	Cash Income
	Dollars		1,000 dollars	
Me.	.25	10,115	8,637	8,372
N. H.	.55	726	652	508
Vt.	.47	1,090	901	606
Mass.	.70	1,365	1,866	1,039
R. I.	.74	237	222	189
Conn.	.56	1,109	1,050	909
N. Y.	.40	11,340	8,963	7,427
N. J.	.47	3,363	3,259	3,106
Pa.	.48	10,296	8,081	6,065
Ohio	.53	6,139	5,161	3,213
Ind.	.46	2,525	2,149	918
Ill.	.57	2,770	2,426	607
Mich.	.26	7,774	5,802	4,721
Wis.	.24	5,429	3,827	2,570
Minn.	.23	6,665	4,110	2,826
Iowa	.39	3,175	2,617	1,016
Mo.	.32	2,912	2,598	966
N. Dak.	.23	2,083	1,189	761
S. Dak.	.25	1,278	877	450
Nebr.	.34	2,924	2,110	1,055
Kans.	.41	2,111	1,909	1,117
Del.	.53	273	249	158
Md.	.54	1,540	1,376	1,008
Va.	.61	5,906	5,500	4,237
W. Va.	.57	1,986	1,651	611
N. C.	.68	4,485	4,305	2,535
S. C.	.88	1,272	1,208	944
Ga.	.73	732	671	284
Fla.	1.09	1,680	1,644	1,574
Ky.	.64	2,957	2,616	889
Tenn.	.75	2,743	2,598	431
Ala.	.84	2,087	1,978	1,222
Miss.	.72	706	652	199
Ark.	.64	1,681	1,521	436
La.	.84	1,814	1,691	1,056
Okla.	.53	1,647	1,508	725
Tex.	.80	3,323	3,154	1,746
Mont.	.40	898	662	340
Idaho	.22	4,269	3,337	3,235
Wyo.	.35	499	341	262
Colo.	.26	2,860	1,904	1,795
N. Mex.	.80	408	333	291
Ariz.	.92	248	219	193
Utah	.28	630	545	476
Nev.	.40	120	102	92
Wash.	.41	2,572	2,077	1,768
Oreg.	.41	2,066	1,643	1,398
Calif.	.57	3,630	3,151	3,061
U. S.	.383	138,456	114,240	79,407

/1. Source of Information: Report of August, 1934, issued by the Division of Crop and Livestock Estimates, Bureau of Agricultural Economics, U.S.D.A.

TABLE V.

FARM VALUE, GROSS INCOME AND CASH INCOME FROM FARM PRODUCTION
POTATOES (white) 1933 CROP /1

State	Production having value	Disposition: Unfit for food or seed	Shrinkage	Used for seed	Home Consumption	Sold or (or for sale)	Percent Sold or For Sale
			1,000 bushels				
Me.	42,000	21,100	725	2,639	1,015	35,521	84.57
N. H.	1,440	58	10	97	250	1,025	71.18
Vt.	1,950	117	10	234	610	979	50.20
Mass.	2,325	93	18	62	364	1,788	76.90
R. I.	370	11	-	4	46	309	83.51
Conn.	2,080	83	17	46	273	1,661	79.85
N. Y.	24,600	1,476	515	2,617	3,335	16,657	67.71
N. J.	7,216	144	-	164	324	6,584	91.24
Pa.	21,357	1,068	402	2,981	3,915	12,991	60.82
Ohio	8,064	161	-	979	2,880	4,044	50.14
Ind.	3,192	96	-	474	1,872	750	23.49
Ill.	1,584	48	-	182	1,270	84	5.30
Mich.	20,670	1,240	244	3,177	4,030	11,979	57.95
Wis.	16,730	1,171	233	3,003	4,800	7,523	44.96
Minn.	22,712	1,590	240	4,014	5,100	11,768	51.81
Iowa	5,100	153	-	805	3,366	776	15.21
Mo.	2,808	56	-	211	1,560	981	34.93
N. Dak.	9,300	465	56	1,678	1,560	5,541	59.58
S. Dak.	2,480	99	-	582	1,375	424	17.09
Nebr.	8,625	172	60	582	1,860	5,951	68.99
Kans.	2,436	73	-	123	1,274	966	39.65
Del.	444	9	-	35	165	237	53.37
Md.	2,700	54	-	226	630	1,790	66.29
Va.	8,649	346	-	388	1,792	6,123	70.79
W. Va.	2,331	70	-	326	1,491	444	19.04
N. C.	7,315	146	-	154	2,660	4,355	59.53
S. C.	1,744	35	-	36	330	1,343	77.00
Ga.	1,026	41	-	35	540	410	39.96
Fla.	2,232	22	-	3	70	2,137	95.74
Ky.	4,092	164	-	370	2,610	948	23.16
Tenn.	3,762	150	-	324	2,660	628	16.69
Ala.	2,304	46	-	67	888	1,303	56.55
Miss.	806	32	-	32	585	157	19.47
Ark.	2,613	105	-	101	1,712	695	26.59
La.	2,337	93	-	89	817	1,338	57.25
Okla.	2,484	75	-	140	1,275	994	40.01
Tex.	3,648	146	-	90	1,470	1,942	53.23
Mont.	1,955	98	9	267	726	855	43.73
Idaho	21,850	1,092	-	1,355	368	19,035	87.11
Wyo.	3,007	150	22	397	210	2,228	74.09
Colo.	13,050	1,305	197	1,498	390	9,660	74.02
N. Mex.	640	32	-	77	56	475	74.21
Ariz.	240	5	-	24	28	183	76.25
Utah	2,100	84	17	130	228	1,641	78.14
Nev.	250	10	-	24	22	194	77.60
Wash.	7,380	517	168	491	756	5,448	73.82
Oreg.	6,455	322	50	518	594	4,951	76.93
Calif.	7,920	396	69	454	154	6,847	86.45
U. S.	320,353	16,019	3,062	32,303	64,306	204,663	63.88

/1. Source of Information: Report of August, 1934, issued by the Division of Crop and Livestock Estimates, Bureau of Agricultural Economics, U.S.D.A.

Note:- This income statement is considered to be reasonably indicative of the approximate sales of potatoes for each State during this crop year. The data are preliminary and subject to more interpretation, analysis, and revision before it can be brought into complete conformity with the basic provisions of the proposed potato bill as finally drafted, if passed.

TABLE VI.

FARM VALUE, GROSS INCOME AND CASH INCOME FROM FARM PRODUCTION
POTATOES (White), 1933 CROP /1

State	Farm Price	Farm Value	Gross Income	Cash Income
	Dollars	1,000 Dollars		
Me.	.70	29,400	25,575	24,865
N. H.	1.02	1,469	1,300	1,046
Vt.	.96	1,872	1,525	940
Mass.	1.27	2,955	2,733	2,271
R. I.	1.48	548	525	457
Conn.	1.06	2,805	2,650	1,761
N. Y.	.98	24,108	19,592	16,324
N. J.	1.31	9,455	9,049	8,625
Pa.	.99	21,143	16,737	12,361
Ohio	1.16	9,354	8,032	4,691
Ind.	.99	3,160	2,596	742
Ill.	1.57	2,487	2,126	132
Mich.	.73	15,089	11,687	8,745
Wis.	.65	10,540	7,763	4,739
Minn.	.61	13,854	10,289	7,178
Iowa.	1.03	5,253	4,266	799
Mo.	1.27	3,586	3,227	1,246
N. Dak.	.55	5,115	3,906	3,048
S. Dak.	.75	1,860	1,349	518
Nebr.	.79	6,814	6,171	4,701
Kans.	1.37	3,337	3,069	1,323
Del.	1.05	466	422	249
Md.	1.09	2,945	2,638	1,951
Va.	1.05	9,081	8,311	6,429
W. Va.	1.13	2,634	2,187	502
N. C.	.87	6,364	6,103	3,789
S. C.	.90	1,570	1,506	1,209
Ga.	.87	893	826	357
Fla.	.99	2,210	2,185	2,116
Ky.	1.16	4,747	4,127	1,100
Tenn.	.95	3,574	3,124	597
Ala.	.77	1,774	1,687	1,003
Miss.	.89	717	660	140
Ark.	.87	2,273	2,094	605
La.	.81	1,893	1,746	1,084
Okla.	.94	2,335	2,133	934
Tex.	.84	3,064	2,866	1,631
Mont.	.75	1,466	1,186	641
Idaho	.56	12,236	10,866	10,660
Wyo.	.72	2,165	1,755	1,604
Colo.	.64	8,352	6,432	6,182
N. Mex.	1.06	678	563	504
Ariz.	1.03	247	217	188
Utah	.71	1,491	1,327	1,165
Nev.	.69	172	149	134
Wash.	.67	4,945	4,157	3,650
Oreg.	.71	4,569	3,937	3,515
Calif.	.88	6,970	6,161	6,025
U. S.	.805	263,409	222,932	164,776

/1. Source of Information: Report of August, 1934, issued by the Division of Crop and Livestock Estimates, Bureau of Agricultural Economics, U.S.D.A.

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TABLE VII.

POTATOES: PERCENTAGE DISTRIBUTION OF U. S. PRODUCTION FOR VARIOUS PERIODS

State & Div.	Average Production 5-year Periods 1930-1934	1929-1933	Production from Selected Highs 3 High Acres and Yields 1929-1933	1930-1934	1927-1933	1927-1934	4 Highs 1927-1934
Me.	13.09	13.07	12.59	12.73	11.27	11.74	11.78
N. H.	.43	.41	.39	.40	.39	.38	.39
Vt.	.68	.65	.63	.65	.60	.60	.61
Mass.	.58	.52	.55	.58	.51	.52	.53
R. I.	.11	.09	.09	.10	.08	.09	.09
Conn.	.60	.54	.52	.56	.48	.51	.51
N. Y.	7.78	7.39	7.09	7.33	6.77	6.97	6.99
N. J.	2.19	2.02	2.06	2.18	1.94	1.97	1.98
Pa.	6.86	6.32	5.97	6.74	5.73	6.33	6.27
N. A.	32.32	31.01	29.89	31.27	27.77	29.11	29.15
Ohio	2.91	2.93	2.86	2.83	2.64	2.56	2.63
Ind.	1.38	1.31	1.32	1.38	1.28	1.29	1.32
Ill.	.96	1.07	1.12	1.08	1.12	1.08	1.10
Mich.	6.95	6.11	6.33	7.31	6.54	6.90	6.89
Wis.	6.43	6.02	6.00	6.45	6.05	6.28	6.35
N. C. E.	18.63	17.44	17.63	19.05	17.63	18.11	18.29
Minn.	7.19	7.57	7.19	6.74	8.09	7.70	7.58
Iowa	1.52	1.75	1.79	1.53	1.98	1.90	1.85
Mo.	1.08	1.27	1.33	1.27	1.39	1.32	1.31
N. Dak.	2.25	2.38	2.46	2.43	2.94	2.86	2.70
S. Dak.	.80	1.03	1.14	.91	1.40	1.33	1.28
Nebr.	2.13	2.55	2.84	2.44	2.79	2.66	2.70
Kans.	.99	1.17	1.22	1.12	1.36	1.29	1.30
N. C. W.	15.96	17.70	17.97	16.44	19.95	19.06	18.72
Del.	.14	.12	.14	.15	.14	.15	.15
Md.	.84	.88	.82	.78	.95	.91	.91
Va.	3.40	3.62	3.74	3.44	4.16	3.96	3.95
W. Va.	.82	.89	.91	.80	.99	.95	.94
N. C.	2.28	2.09	2.00	2.17	1.92	2.05	2.05
S. C.	.80	.71	.76	.72	.77	.73	.73
Ga.	.32	.30	.30	.31	.27	.28	.28
Fla.	.75	.74	.88	.89	.88	.86	.87
S. A.	9.35	9.35	9.55	9.26	10.08	9.89	9.88
Ky.	1.13	1.17	1.22	1.11	1.30	1.29	1.27
Tenn.	.99	.96	1.00	.97	.98	.99	.99
Ala.	.82	.72	.75	.83	.66	.73	.71
Miss.	.17	.24	.26	.28	.24	.25	.26
Ark.	.76	.82	.87	.81	.77	.76	.77
La.	.75	.70	.72	.75	.66	.66	.67
Okla.	.85	.88	.85	.81	.83	.79	.79
Tex.	1.17	1.16	1.17	1.12	1.03	.98	.99
S. C.	6.64	6.65	6.84	6.68	6.47	6.45	6.45
Mont.	.52	.55	.54	.53	.61	.58	.59
Idaho	6.20	6.18	6.09	5.97	5.65	5.40	5.56
Wyo.	.67	.74	.93	.89	.92	.87	.83
Colo.	3.21	3.85	4.18	3.60	4.09	3.90	3.96
N. Mex.	.13	.13	.13	.14	.12	.12	.12
Ariz.	.07	.07	.07	.06	.06	.06	.06
Utah	.54	.61	.64	.58	.57	.54	.55
Nev.	.09	.11	.13	.10	.17	.17	.15
Wash.	2.01	2.08	1.95	1.88	2.23	2.12	2.10
Oreg.	1.56	1.47	1.55	1.55	1.40	1.36	1.38
Calif.	2.10	2.06	1.91	2.00	2.28	2.26	2.21
West.	17.10	17.85	18.12	17.30	18.10	17.38	17.51
U. S.	100.00	100.00	100.00	100.00	100.00	100.00	100.00

TABLE VIII.

IRISH POTATOES: FARMS REPORTING, ACREAGE, PRODUCTION, AND SALES FOR CROP OF 1919 1/.

States	Farms Reporting	Acres	Bushels	Sold or to be Sold			Percent Of Total Sold	Estimated Average Quantity Sold Per Farm Selling Bushels
				Farms Reporting				
				Farms	Percent Of Total	Bushels		
					"Col.4÷Col.1"		"Col.6÷Col.3"	"Col.6÷Col.4"
	1	2	3	4	5	6	7	8
Maine	36,896	111,378	25,531,470	18,299	49.59	20,427,958	80.01	1116.3
New Hampshire	16,152	13,334	1,341,978	5,182	32.08	441,769	32.91	85.2
Massachusetts	22,813	21,558	1,885,655	8,074	35.39	872,809	46.28	108.1
Rhode Island	2,987	3,149	293,087	1,018	34.08	179,752	61.33	176.5
Vermont	24,581	24,182	2,277,387	7,632	31.04	621,288	27.28	81.4
Connecticut	16,828	18,300	1,372,449	4,870	28.93	602,655	43.91	123.7
New York	163,148	310,403	32,470,847	75,589	46.33	20,199,931	62.20	267.2
New Jersey	19,105	82,533	10,319,306	10,336	54.10	9,155,883	88.72	885.8
Pennsylvania	177,541	233,981	22,051,685	78,561	44.24	11,807,999	53.54	150.3
Ohio	144,203	124,917	7,513,960	27,126	18.81	2,644,540	35.19	97.4
Indiana	93,596	62,192	2,477,034	8,717	9.31	497,072	20.06	57.0
Illinois	151,233	86,384	4,699,134	19,558	12.93	1,146,895	24.40	58.6
Michigan	155,752	280,538	23,929,560	64,339	41.30	13,815,844	57.73	214.7
Wisconsin	166,231	294,424	26,376,021	60,890	36.62	15,684,335	59.46	257.5
Minnesota	135,611	331,930	26,690,056	46,355	34.18	16,987,336	63.64	366.4
Missouri	159,887	66,051	4,057,753	20,619	12.89	882,262	21.74	42.7
Iowa	131,292	97,336	4,438,515	8,336	6.34	651,890	14.68	78.2
North Dakota	54,221	82,561	4,717,556	5,997	11.06	1,993,741	42.26	332.4
South Dakota	43,412	58,180	2,863,186	5,110	11.77	1,034,095	36.11	202.3
Nebraska	79,628	94,247	4,452,497	6,729	8.45	1,724,226	38.72	256.2
Kansas	92,514	47,246	3,014,845	10,381	11.22	1,000,255	33.17	96.3
Montana	20,490	4,903	1,659,017	3,871	18.89	703,925	42.43	181.8
Idaho	16,723	43,196	6,300,835	6,701	40.07	4,664,483	74.02	696.0
Wyoming	6,066	11,791	851,253	1,460	24.06	463,098	54.40	317.1
Colorado	17,903	50,631	8,874,783	7,818	43.66	6,771,699	76.30	866.1
New Mexico	1,454	504	110,740	224	15.40	22,169	20.01	98.9
Arizona	791	2,505	174,301	390	49.30	110,465	63.37	283.2
Utah	11,453	12,047	1,648,400	4,327	37.78	948,838	57.56	219.2
Nevada	1,266	3,639	490,727	493	38.94	304,747	62.10	618.1
Washington	36,085	8,187	5,866,710	13,163	36.47	3,585,633	61.11	272.4
Oregon	24,685	1,880	3,538,930	9,076	36.76	1,742,478	49.23	191.9
California	11,518	2,707	8,217,937	5,669	49.21	7,167,391	87.21	1264.3
Maryland	32,520	46,837	4,918,766	15,661	48.15	3,280,675	66.69	209.4
Delaware	6,180	8,255	487,668	2,837	45.90	250,254	51.31	88.2
Virginia	91,264	105,789	12,263,374	20,216	21.98	9,830,067	80.15	486.2
West Virginia	70,155	34,526	2,809,398	14,340	20.44	585,818	20.85	40.8
North Carolina	79,069	35,797	2,853,797	11,582	14.64	1,443,577	50.58	124.6
South Carolina	21,927	13,402	1,077,936	1,738	7.92	533,535	49.49	306.9
Georgia	32,658	11,195	693,857	2,957	9.05	162,603	23.43	54.9
Florida	4,931	17,525	1,767,196	1,910	38.73	1,657,290	93.78	867.6
Kentucky	101,904	50,069	3,131,377	10,409	10.21	1,177,166	37.59	113.0
Tennessee	100,502	29,873	1,990,951	11,771	11.71	383,224	19.24	32.5
Alabama	48,010	13,397	886,450	3,284	6.84	125,713	14.18	38.2
Texas	62,280	27,263	1,707,251	9,720	15.60	573,858	33.61	59.0
Mississippi	28,459	8,993	650,970	2,383	8.37	107,394	16.49	45.0
Oklahoma	66,811	25,633	1,924,194	9,809	14.68	535,555	27.83	54.5
Arkansas	81,751	24,128	1,765,277	9,044	11.06	260,796	14.77	28.8
Louisiana	23,382	19,677	971,705	3,933	16.82	349,515	35.96	88.8
Total U. S.	2,887,992	3,059,173	290,427,580	678,562	23.49	169,523,734	58.37	249.8

1/ Source of Information: 1920 Census, Volume 5, Page 724.

Table IX

IRISH POTATOES

Acreage - (1,000 Acres)

States	1927	1928	1929	1930	1931	1932	1933	1934 1/	5-Year Average 1930-34 1/	Percent of Distribution of 5-Year Av. to Total U.S. 5-Year Av. 1/
Surplus Late										
Maine	157	176	166	179	186	170	150	168	171	5.25
New York	230	232	213	198	202	210	200	210	204	6.26
Pennsylvania	198	210	195	189	191	195	189	200	193	5.93
3 Eastern	585	618	574	566	579	575	539	578	568	17.42
Michigan	263	271	225	227	250	260	265	268	254	7.80
Wisconsin	255	273	215	239	268	260	239	261	253	7.77
Minnesota	338	379	330	314	361	379	334	334	344	10.57
North Dakota	95	123	121	97	121	161	150	132	132	4.05
South Dakota	55	60	56	58	54	73	62	43	58	1.78
5 Central	1006	1106	947	935	1054	1133	1050	1038	1042	32.02
Nebraska	99	119	101	101	131	135	115	115	119	3.65
Montana	22	23	21	18	19	22	23	23	21	.64
Idaho	103	104	82	98	110	99	95	104	101	3.10
Wyoming	17	22	20	22	31	33	31	25	28	.86
Colorado	99	114	90	92	101	100	87	76	91	2.79
Utah	14	14	11	12	15	15	14	13	14	.43
Nevada	6	5	4	3	3	2	2	2	2	.06
Washington	61	54	44	48	44	40	41	45	44	1.35
Oregon	40	41	33	33	42	42	39	44	40	1.22
California	49	53	33	33	37	33	33	41	35	1.07
10 Western	510	549	439	460	533	521	480	488	496	15.24
Total 18 Surplus	2101	2273	1960	1961	2166	2229	2069	2104	2106	64.72
Other Late										
New Hampshire	10	10	8	9	9	8	8	9	9	.27
Vermont	18	17	15	15	17	16	15	16	16	.49
Massachusetts	14	14	11	11	13	13	15	16	14	.43
Rhode Island	2	2	2	2	2	2	2	3	2	.06
Connecticut	13	12	11	11	12	12	13	15	13	.39
5 New England	57	55	47	48	53	51	53	59	53	1.62
West Virginia	35	38	36	38	40	41	37	40	39	1.19
Ohio	110	119	105	105	110	117	112	109	111	3.41
Indiana	48	55	50	51	58	61	57	62	58	1.78
Illinois	49	53	47	47	50	54	48	52	50	1.53
Iowa	72	81	77	70	70	74	75	77	73	2.24
5 Central	314	346	315	311	328	347	329	340	331	10.17
New Mexico	3	4	4	5	5	6	8	7	6	.18
Arizona	4	3	2	3	3	3	3	3	3	.09
2 Southwestern	7	7	6	8	8	9	11	10	9	.27
Total 12 Late	378	408	368	367	389	407	393	409	393	12.07
Total 30 Late	2479	2681	2328	2328	2555	2636	2462	2513	2499	76.79
New Jersey	46	47	38	37	41	45	44	50	43	1.32
Delaware	5	5	4	4	5	6	6	6	6	.18
Maryland	33	36	30	30	32	31	30	33	31	.95
Virginia	108	121	103	117	118	94	93	101	105	3.22
Kentucky	50	56	49	44	55	60	62	64	57	1.75
Missouri	47	59	50	49	54	56	54	46	52	1.59
Kansas	46	50	44	42	46	44	42	37	42	1.29
Total 7 Intermediate	335	374	318	323	351	336	331	337	336	10.32
37 Late and Intermediate	2814	3055	2646	2651	2906	2972	2793	2850	2835	87.11

37 Late and Intermediate	2814	3055	2646	2651	2906	2972	2793	2850	2834	87.09
North Carolina	68	83	62	76	79	68	77	92	78	2.39
South Carolina	22	29	20	21	25	17	16	21	20	.61
Georgia	11	14	13	15	18	17	18	20	18	.55
Florida	29	32	23	32	28	23	18	25	25	.76
Tennessee	39	43	39	41	57	51	54	60	53	1.62
Alabama	26	31	22	28	39	36	32	40	35	1.07
Mississippi	8	10	9	9	14	14	13	16	13	.39
Arkansas	31	36	29	31	43	37	39	41	38	1.16
Louisiana	36	38	29	34	48	40	41	44	41	1.25
Oklahoma	40	52	39	38	45	42	36	40	40	1.22
Texas	42	46	42	54	64	62	57	54	58	1.78
Total 11 Early	352	414	327	379	460	407	401	453	420	12.90
United States	3166	3469	2973	3030	3366	3379	3194	3303	3254	99.99

1/ Preliminary.

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Table X

IRISH POTATOES

Yield Per Acre - Bushels

States	1927	1928	1929	1930	1931	1932	1933	1934 1/	5-Year Average 1930-34 1/	5-Year State Average Deviation from U.S. 5-Year Average Percent 1/
Surplus Late										
Maine	230	220	292	250	258	238	280	335	272	+ 149.5
New York	112	119	101	118	142	135	123	155	135	+ 23.8
Pennsylvania	110	127	107	95	139	110	113	170	125	+ 14.7
3 Eastern	143	150	158	152	178	157	163	212	172	+ 57.8
Michigan	84	116	71	63	95	115	78	128	96	- 11.9
Wisconsin	92	112	96	76	93	87	70	120	89	- 18.3
Minnesota	99	109	78	72	80	78	68	70	74	- 32.1
North Dakota	97	99	56	65	74	58	62	45	61	- 44.0
South Dakota	115	96	75	63	40	70	40	30	49	- 55.0
5 Central	94	110	77	70	84	85	68	93	80	- 26.6
Nebraska	101	91	93	95	55	65	75	30	64	- 41.3
Montana	140	115	89	98	85	102	85	70	88	- 19.3
Idaho	230	184	188	250	220	200	230	185	217	+ 99.1
Wyoming	130	105	92	150	95	45	100	40	86	- 21.1
Colorado	165	155	163	190	95	110	150	75	124	+ 13.8
Utah	135	144	185	180	130	150	150	80	138	+ 26.6
Nevada	136	140	140	170	87	150	125	105	127	+ 16.5
Washington	195	170	165	160	155	160	180	162	163	+ 49.5
Oregon	120	123	102	155	130	120	160	130	139	+ 27.5
California	175	160	205	210	195	193	240	210	210	+ 92.7
10 Western	163	142	144	172	126	122	151	110	136	+ 24.8
Total 18 Surplus	124	129	116	117	120	112	112	130	118	+ 8.2
Other Late										
New Hampshire	125	110	145	185	165	165	180	185	176	+ 61.5
Vermont	125	120	125	165	150	145	130	170	152	+ 39.4
Massachusetts	85	90	105	170	125	150	155	160	152	+ 39.4
Rhode Island	100	110	127	190	150	160	185	180	173	+ 58.7
Connecticut	90	115	117	175	160	165	160	175	167	+ 53.2
5 New England	106	109	122	173	149	155	154	171	160	+ 46.8
West Virginia	105	120	105	63	80	85	63	78	74	- 32.1
Ohio	101	96	96	88	102	99	72	105	93	- 14.7
Indiana	95	105	84	89	85	90	56	100	84	- 22.9
Illinois	84	110	84	78	85	90	33	52	68	- 37.6
Iowa	82	128	100	70	55	110	68	63	73	- 33.0
5 Central	93	110	94	80	84	97	62	83	81	- 25.7
New Mexico	75	70	80	70	77	85	80	70	76	- 30.3
Arizona	80	74	85	85	85	90	80	60	80	- 26.6
2 Southwestern	78	72	82	76	80	87	80	67	78	- 28.4
Total 12 Late	95	109	98	92	92	104	75	96	92	- 15.6
Total 30 Late	120	126	113	113	115	111	106	124	114	+ 4.6
New Jersey	161	165	129	203	191	159	164	181	180	+ 65.1
Delaware	119	94	86	50	108	86	74	120	88	- 19.3
Maryland	133	127	113	84	105	92	95	99	95	- 12.8
Virginia	161	156	148	121	121	103	93	133	114	+ 4.6
Kentucky	90	106	95	63	72	77	66	70	70	- 35.8
Missouri	83	121	79	107	76	100	52	30	73	- 33.0
Kansas	110	150	90	114	79	117	58	40	82	- 24.8
Total 7 Intermediate	129	140	115	115	107	106	86	100	103	- 5.5
37 Late and Intermediate	121	127	113	113	114	110	104	121	112	+ 2.8
North Carolina	97	113	99	95	108	97	95	116	102	- 6.4
South Carolina	114	113	130	135	140	85	109	125	119	+ 9.2
Georgia	70	66	68	67	66	59	57	68	63	- 42.2

Intermediate	129	140	119	119	101	110					
37 Late and Intermediate	121	127	113	113	114	110	104	121	112	+	2.8
North Carolina	97	113	99	95	108	97	95	116	102	-	6.4
South Carolina	114	113	130	135	140	85	109	125	119	+	9.2
Georgia	70	66	68	67	66	59	57	68	63	-	42.2
Florida	105	125	118	80	130	67	124	130	106	-	2.8
Tennessee	75	86	81	67	59	69	66	72	67	-	38.5
Alabama	73	76	76	77	94	69	72	94	81	-	25.7
Mississippi	72	76	78	66	79	70	62	84	72	-	33.9
Arkansas	68	81	87	87	85	71	67	64	75	-	31.2
Louisiana	53	65	56	64	75	54	57	67	63	-	42.2
Oklahoma	73	72	75	88	72	74	69	69	74	-	32.1
Texas	68	68	71	81	73	67	64	70	71	-	34.9
Total 11 Early	80	88	85	84	87	73	75	87	81	-	25.7
United States	116	123	110	110	111	106	100	117	109		

1/ Preliminary

Table XI

IRISH POTATOES

Production - (1,000 Bushels)

States	1927	1928	1929	1930	1931	1932	1933	1934 1/	5-Year Average 1930-34 1/	Percent of Distribution of 5-Year Av. to Total U.S. 5-Year Av. 1/
Surplus Late										
Maine	36110	38720	48472	44750	47988	40460	42000	56280	46296	13.08
New York	25760	27608	21513	23364	28684	28350	24600	32550	27510	7.77
Pennsylvania	21780	26670	20865	17955	26549	21450	21357	34000	24262	6.85
3 Eastern	83650	92998	90850	86069	103221	90260	87957	122830	98067	27.71
Michigan	22092	31436	15975	14301	23750	29900	20670	34304	24585	6.94
Wisconsin	23460	30576	20640	18164	24924	22620	16730	31320	22752	6.43
Minnesota	33462	41311	25740	22608	28880	29562	22712	23380	25428	7.18
North Dakota	9215	12177	6776	6305	8954	9338	9300	5940	7967	2.25
South Dakota	6325	5760	4200	3654	2160	5110	2430	1290	2939	.83
5 Central	94554	121260	73331	65032	88668	96530	71892	96234	83671	23.64
Nebraska	9999	10829	9393	9595	7205	8775	8625	3450	4142	1.17
Montana	3080	2545	1869	1764	1615	2244	1955	1610	1838	.51
Idaho	23690	19136	15416	24500	24200	19800	21850	19240	21718	6.13
Wyoming	2210	2310	1840	3300	2945	1485	3100	1000	2366	.66
Colorado	16335	17670	14670	17480	9595	11000	13050	5700	11365	3.21
Utah	1890	2016	2035	2160	1950	2250	2100	1040	1900	.53
Nevada	816	700	560	510	261	300	250	210	306	.08
Washington	11695	9180	7260	7630	6820	6400	7380	7290	7114	2.01
Oregon	4800	5043	3366	5115	5460	5040	6240	5720	5515	1.55
California	8575	8480	6765	6930	7215	6369	7920	8610	7409	2.09
10 Western	83290	78009	63174	79034	67266	63663	72470	53870	67870	19.18
Total 18 Surplus	261494	292267	227355	230135	259155	250453	232319	272934	248999	70.37
Other Late										
New Hampshire	1250	1100	1160	1665	1485	1320	1440	1665	1515	.42
Vermont	2250	2040	1875	2475	2550	2320	1950	2720	2403	.67
Massachusetts	1190	1260	1155	1870	1625	1950	2325	2560	2066	.58
Rhode Island	200	220	254	380	300	320	370	540	382	.10
Connecticut	1170	1380	1287	1925	1920	1980	2080	2625	2106	.59
5 New England	6060	6000	5731	8315	7880	7890	8165	10110	8472	2.39
West Virginia	3675	4560	3780	2394	3200	3485	2331	3120	2906	.82
Ohio	11110	11424	10080	9240	11220	11583	8064	11445	10310	2.91
Indiana	4560	5775	4200	4539	4930	5490	3192	6200	4870	1.37
Illinois	4116	5830	3948	3666	4250	4860	1584	2704	3413	.96
Iowa	5904	10368	7700	4900	3850	8140	5100	4851	5368	1.51
5 Central	29365	37957	29708	24739	27450	33558	20271	28320	26868	7.59
New Mexico	225	280	320	350	385	510	640	490	475	.13
Arizona	320	222	170	255	255	270	240	180	240	.06
2 Southwestern	545	502	490	605	640	780	880	670	715	.20
Total 12 Late	35970	44459	35929	33659	35970	42228	29316	39100	36055	10.19
Total 30 Late	297464	336726	263284	263794	295125	292681	261635	312034	285054	80.63
New Jersey	7406	7755	4902	7511	7831	7155	7216	9050	7753	2.19
Delaware	595	470	344	200	540	516	444	720	484	.13
Maryland	4389	4572	3390	2520	3360	2852	2850	3267	2970	.83
Virginia	17388	18876	15244	14157	14278	9682	8649	13433	12040	3.40
Kentucky	4500	5936	4655	2772	3960	4620	4092	4480	3985	1.12
Missouri	3901	7139	3950	5243	4104	5600	2808	1380	3827	1.08
Kansas	5060	7500	3960	4788	3634	5148	2436	1480	3497	.98
Total 7 Intermediate	43239	52248	36445	37191	37707	35573	28495	33810	34555	9.76
37 Late and Intermediate	340703	388974	299729	300985	332832	328254	290130	345844	319609	90.33
North Carolina	6596	9375	6138	7220	8532	6596	7315	10672	8067	2.28
South Carolina	2508	3277	2600	2835	3500	1446	1746	2625	2430	.68

37 Late and Intermediate	340703	388974	299729	300985	332832	328254	290130	345844	319609	90.33
North Carolina	6596	9379	6138	7220	8532	6596	7315	10672	8067	2.28
South Carolina	2508	3277	2600	2835	3500	1445	1744	2625	2430	.68
Georgia	770	924	884	1005	1188	1003	1026	1360	1116	.31
Florida	3045	4000	2714	2560	3640	1541	2232	3250	2645	.74
Tennessee	2925	3698	3159	2747	3363	3519	3564	4320	3503	.99
Alabama	1898	2356	1672	2156	3666	2484	2304	3760	2874	.81
Mississippi	576	760	702	594	1106	980	806	1344	966	.27
Arkansas	2108	2916	2525	2697	3655	2627	2613	2624	2843	.80
Louisiana	1908	2470	1624	2176	3600	2160	2337	2948	2644	.74
Oklahoma	2920	3744	2925	3344	3240	3108	2484	2760	2987	.84
Texas	2856	3128	2982	4374	4672	4154	3648	3780	4126	1.16
Total 11 Early	28110	36652	27923	31708	40162	29617	30073	39443	34201	9.66
United States	368813	425626	327652	332693	372994	357871	320203	385287	353810	99.99

1/ Preliminary

SUMMARY OF REPORTS

Given at the

CANNERS' AND FIELD MEN'S CONFERENCE

Held under the Auspices of the Agricultural Experiment Station and Extension Service of the University of Maryland in Cooperation with the Tri-State Packers' Association

College Park, Maryland

February 26 and 27, 1935

Welcome to the University

by

R. A. Pearson, President, University of Maryland

Dr. Pearson welcomed the visitors to the campus and to the facilities of the University and presented the status of appropriations to the University.

Highlights from Other Canners' Conferences

by

C. G. Woodbury, National Canners' Association

Mr. Woodbury presented the highlights, as well as many interesting sidelights, of the canners' conferences held this year in Indiana and Ohio. These conferences were well attended and much valuable information was presented by the speakers. Methods were employed in conducting the conferences which seem interesting and effective and which can probably be utilized in Maryland in future years.

Agricultural Adjustment Administration Plans, Past and Present, Relating to Canning Crops

by

Banks Collings, Agricultural Adjustment Administration

The Agricultural Adjustment Administration, as originally played up, was primarily interested in reductions. It is now concerned more with adjustment to current demands than with curtailment of production. The idea of reducing crop production was not very well liked, particularly by the members of the Administration.

The activities of the AAA with the so-called basic crops, in which a processing tax was levied to pay the producer for curtailment of production, is well known to most people. With many specialized crops, processing taxes could not be levied, and the marketing agreement section was set up to handle these crops. In order to establish a marketing agreement, the handlers must agree to limit production of sale of the commodity to meet demand without benefit payments. Parity prices used in marketing agreements are based on the index of purchasing power in the 1909-1914 era. Thirty-five marketing agreements are now in effect, in addition to milk and other licenses.

In order to easily effectuate a marketing agreement it is necessary that the producers must be in a compact area, that the methods of distribution be uniform, and that the parties concerned have had experience in working together on previous problems. Equal distribution of benefits to all is an impossible situation. It is not the policy of the AAA to initiate marketing agreements, but rather to cooperate with those groups that wish to draw up such agreements.

Corn, tomato, and sauerkraut canners voluntarily agreed in 1933 to increase the contract price to the growers. The additional returns to Maryland growers as a result of this action was $198,000 for tomatoes and $44,000 for corn. The instigation of marketing agreements for corn, peas, and tomatoes in 1934 was not successful, due partially to the lack of accurate statistical information. The problems are immeasurably greater in drawing up marketing agreements for crops grown throughout the Nation than

for those grown in compact areas, because of differences in methods, prices, freight rates, etc., in the different sections.

Marketing agreements are now in effect for California cling peaches, canned asparagus, and canned olives. A hearing was held recently for an agreement for canned red, sour cherries, and an agreement has been drafted for canned Bartlett pears.

How to Select Suitable Fertilizers for Canning Crops

by

J. E. Metzger, University of Maryland

Fertilizer Tonnage:- The total sales of mixed fertilizers for the fiscal year 1933-34 were somewhat more than 100,000 tons. This tonnage was divided between 132 registered analyses. Of this large list more than one-half of the sales was made up from five of the most important mixtures. It was found on study of the distribution of the fertilizer tonnage that the twenty-two analyses finally adopted for use in Maryland would cover 92 per cent of the total tonnage, thus leaving only 8 per cent of the tonnage for the other 110 analyses. In fact, the principal changes occurred with five easily replaceable fertilizers. In the new list 2-9-5 replaces 2-8-5, 1-9-4, and 1-10-4. The 5-10-5 replaces fertilizers like 5-8-5, 4-8-4, and 2-9-2. The chief values of the reduced number of fertilizer analyses are the elimination of low grade goods, a reduction in the total tonnage without any reduction in the amount of plant food, and a cheapening of the cost of printing the packages together with other economies in the factory. These basic items are manufacturing and distribution costs which in the Maryland territory have been found to be slightly over $11.00 per ton, regardless of the quality of the fertilizer involved. A complete study of the factors will show that high grade fertilizers cost less per unit of plant food than do the low grade fertilizers.

Organic Matter:- America's best example of fertility trends may be found in the results of the long-time fertilizer and organic matter experiments at the Pennsylvania State College. In these experiments it was found that 6 tons of manure applied once during each four-year rotation, or the equivalent of 1½ tons of stable manure per year per acre, was sufficient to maintain a rather constant fertility level throughout the forty-year period. A commercial fertilizer in which the nitrogen-phosphorus ratio was 1 to 2 and in which the potash units were twice as high as the phosphorus units, all of which was applied at the rate of 400 lbs. per rotation, was not quite able to maintain the fertility level. Where neither organic matter nor commercial fertilizer was used the fertility of the soil remained almost constant for a period of twelve years. It then made a precipitate drop to almost half the original fertility level and continued more or less constant from that time forward. A shorter time experiment covering much the same features was conducted at the Maryland Station. The results were quite similar excepting that they proceeded much more rapidly than at the Pennsylvania location which is farther north and at a higher elevation. At the Maryland Station it was found that 2 tons of manure per acre together with sufficient superphosphate to maintain the equivalent of twelve units was sufficient to completely maintain a given fertility level where corn, wheat and hay were grown in the rotation.

Fertilizer Ratios:- The very early fertilizer work was based almost entirely upon plant analysis and soil analysis. Plants removed a certain amount of the nutritional elements. It was reasoned that these must be

restored before the next crop could be grown. The result was that calculations were made in pounds of nitrogen, phosphorus and potash. In investigations of more recent years it was found that it is necessary to balance the supply of the various plant nutritional elements. To do so it is necessary to take into account the available supply in the soil together with the crop needs and the crop quality desired. In most canning crops the aim is to produce a product that carries the maximum amount of sugar with a minimum amount of starches. This is particularly important in the case of canning peas and has also a very decided bearing in the case of canning corn, The highest quality product in peas seems to be secured where the nitrogen-phosphorus ratio is quite narrow, such as 1 to 1 and not more than 1 to 2. A narrow ratio between these elements with sweet corn results in a large number of unmerchantable ears. The research on this point indicates that a ratio of 1 to 4 produces the greatest number of canning ears per acre and also induces uniform ripening in the field. On the other hand, corn fertilized with this kind of fertilizer ripens more rapidly than where a narrow nitorgen-phosphorus ratio is used. With tomatoes a 1 to 2 ratio seems to be most satisfactory. In addition, potash is an important factor. The practice in the past has been to use about an equal number of units of phosphorus and potash. There is some evidence that this might be increased so that the ratio of nitrogen, phosphorus, and potash would be 1-2-2.5. The higher amount of potash seems to be reflected both in the yield and quality of the tomato crop.

Economy in Use of Fertilizers by Proper Placement

by

C. B. Sayre, Geneva Experiment Station

Inorganic nitrogenous fertilizer materials are soluble and move up and down with the soil water. There is very little side movement. Phosphorus moves very little in the soil and is quickly fixed in insoluble form. Potassium salts dissolve quickly but move intermediately between nitrogen and phosphorus. This may be as much as four inches in a sandy soils. All of the materials move less in heavy than in sandy soils.

The soluble salts leave the fertiliger rapidly when placed in a moist soil, resulting in an excessive concentration which is injurious to germinating seeds in contact with it. Bean seed and plants were placed in bands of fertilizer in experiments where the fertilizer had been applied just previous to planting. The germinating seed and the plants were greatly injured, but those that survived did not show any great additional injury after four days. There was no injury when the beans were planted in the fertilizer band six days after the fertilizer was applied. There was no injury at all when the beans were planted one-half inch from the fertilizer. In this experiment, however, one-fourth inch of water was applied immediately after the fertilizer. Under similar conditions there might have been injury after two weeks if there had been no water applied and no rain.

Twenty-five days after planting, beans had made a dense root growth right in the fertilizer band, whether the fertilizer was applied to one side of the row or below the seed. Longer, more scattered roots were growing outside of the fertilizer band. The response of cabbage and tomatoes

was similar to beans.

The advantages of fertilizer placement over broadcast application are: (1) small amounts may be used with equal results on the immediate crop, and (2) there is less fixation of phosphorus in insoluble form. A disadvantage is the residual effect which might cause unequal growth in a succeeding crop such as peas. Also, there might be a disadvantage in a drought year due to restriction of the root system.

Fertilizer should not be placed in direct contact with seed or plants. Placement under the seed or plant would be satisfactory in a wet season but might cause severe injury in a dry season. Placement on top of the row might be injurious, and phosphorus would not move downward to the roots. The safest placement is from 1½ to 2½ inches to the side and one inch below the seed level. Placement in one band has been as effective as two bands, one on either side of the row. It is better not to mix the fertilizer in the band with the soil.

In yield records on wax beans and tomatoes, using a 4-16-4 fertilizer, band applications gave practically the same results as double the quantity of fertilizer applied broadcast. Experiments have not been conducted over a sufficiently long period of years to determine if band application will maintain soil fertility. Such experiments are in progress at the present time, however.

Our Experiences in Improving Soil Fertility and Increasing Yields

by

Charles Mills, Stokely Bros. Company

Agriculture has an element of mystery, which makes farming interesting, but it also has an element of danger in that one can so easily follow the sign posts of faith rather than fact. Important factors in agriculture are the sun, the elements in the air, the elements in the soil, and moisture. Man can influence the latter two.

Moisture and plant food are so interrelated that they must be discussed together. There must be moisture for the solubility of plant food if it is to operate in the growth of plants.

There are at least nine important points to bear in mind in soil fertility practices:

1. Seeding is apt to be too heavy. A simple definition of a weed is that it is a plant out of place. It is just as well to let a lima bean plant be choked out by crab grass as by other lima bean plants. Thick stands draw heavily on both plant food and moisture.

2. Plow deep and early. The first few inches of light soils are usually dry, and the lower soil should be prepared for proper root development and plant growth. In order to have the soil settled, it is necessary to plow early.

3. Cover crops help to maintain soil fertility, and this can best be accomplished with legumes rather than with rye or wheat. The use of

legumes ultimately cuts down the amount of nitrogen needed in the fertilizer. Turn down cover crops early to give bacteria a chance to decompose the material before crops are planted.

4. Cultivate only as many times as is necessary to control weeds. If cultivation dries the soil out in the spring, there is no reason why it would not accomplish the same result in the summer. Experiments show that a mulch is not necessary for crop production. The proper timing of cultivations will eliminate the number necessary to control weeds.

5. Fertilizer placement gives the greatest returns per dollar invested, but not necessarily the greatest possible net returns per acre. One fault with broadcast applications is that the fertilizer is usually applied in the surface soil and frequent cultivations have prevented the roots from growing in this area. Plowing the fertilizer down distributes it in the region where the roots normally grow. This has worked out well in practice with summer crops. It is not necessary in the spring crops because of heavier rains at this time.

6. The amount of fertilizer should be increased as long as additional quantities pay a small dividend.

7. The analysis of fertilizer which will give the best results varies widely. In general, it seems that more potash is needed than has been applied in the past.

8. There is not much choice in sources of phosphorus and potash. Cyanamide was used at the Rehoboth plant four years ago and is now the exclusive source of nitrogen. It does not leach as badly as other sources of inorganic nitrogen and it supplies calcium to neutralize soil acidity. It may be dangerous for the person who does not know how to use it. Cyanamide must be applied to the soil some time in advance of seeding, and it should not be mixed with other materials until immediately before applying.

9. The type of labor used on the farm is an important consideration. It seems to have been the assumption that farmers could use the cheapest type of labor. Dollar-a-day labor may be more expensive in the end than three-dollar men.

Discussion of Soil Fertility and Fertilizer Practices

Led By

L. M. Goodwin, American Can Company

Soil fertility is an especially important consideration in the Tri-State territory, where production costs are generally higher than in competing areas. It is well established that there is a direct relationship between yield per acre and quality of the product.

Canners and fieldmen could profitably make use of the soil survey maps of their respective counties, coupled with the use of Maryland Experiment Station bulletin No. 351, "The Soils of Maryland: Productivity Classification", both of which may be obtained through the county agents. The use of these publications would be of especial benefit in selecting land for peas, where the seed loss is the canner's loss.

Mr. Charles Mills: Cyanamid must be allowed to run its course of chemical changes to urea in moist soil before seed is planted. As a general rule, three days are allowed for each 100 pounds of cyanamid used per acre. Cyanamid and superphosphate should be mixed immediately before applying to prevent a partial loss of nitrogen and reversion of the superphosphate to an insoluble form.

With land rental so cheap it does not seem worthwhile to follow peas with lima beans. Double cropping prevents the planting of a legume cover crop with peas and makes it harder to get the land prepared in good condition. Sweet clover is sown just ahead of the pea drill. The clover seed is not inoculated, but the crop rarely succeeds on land that has not grown clover previously.

Prof. C. B. Sayre: New York growers use sweet clover with peas to good advantage. Liberal fertilization of peas delays maturity and prolongs the harvesting season, making it possible to secure better quality.

Fertilizer placement is not a proven practice with canning crops, particularly those preceding peas. Farmers can save money by this method for several years, but it may not maintain the soil fertility. Fertilizer placement in two bands gives faster early growth but not a larger total yield.

Mr. F. M. Shook: Row placement of fertilizer was used in growing tomatoes in Ohio many years ago. Peas following on the same ground did not show uneven maturity.

New Varieties and Strains of Tomatoes for Canning

by

Warren B. Mack, Penna. State College.

It must be assumed that those varieties doing best in Pennsylvania will not necessarily do well in Maryland. In Pennsylvania, the market tomato crop is important, and much of the variety test work is done with this crop in mind.

Less attention is now given to actual yields than formerly. More attention is being given to type, because type is less affected by climate than is yield, though it is affected to some extent.

Last season, 76 varieties were included in the tests - several strains of Marglobe were grown. The two showing best type were Crown Picked and Marglobe N43.1M.

Bonny Best and Jno. Baer gave a low marketable yield during the last three weeks of the season. These varieties lose their foliage fast. One important observation has been made in these trials -- it is characteristic of those varieties which have heavy foliage, and are vigorous, to hold up well during the main and latter part of the season, giving a high per cent of marketable yield.

The recently developed Penn State is an early market tomato, similar to Bonny Best in internal characters, but being smoother and more uniform. The plant is a small, self-pruning type. It matures 3 - 4 days later than Earliana and loses its foliage rapidly.

Yields of Greater Baltimore and Indiana Baltimore were high.

Most of the Marglobe strains yielded well, retained their leaves late in the season, and gave a high per cent marketable yield.

Professor Schermerhorn discussed the Rutgers tomato, which was developed at the New Jersey Station. It has a fruit similar to Marglobe, sets freely, and ripens from the inside out. It is deep red in color, and very good for juice. The fruit is meaty and thick-walled. The vine is very vigorous. This variety will be included in variety tests at the Maryland Station this year.

Tomato Variety Tests in Maryland

by

T. D. Holder, University of Maryland.

Varieties included in the tests at College Park and Ridgely were Greater Baltimore, Brown's Special, Marglobe "A", Stone, Pritchard, Tri-State Baltimore, Market Champion and White's No. 4. After picking, the tomatoes were graded, and each grade weighed.

Greater Baltimore, Pritchard, and Tri-State gave the highest early pickings and decreased rapidly. The two newer varieties, Brown's Special and Market Champion were considerably later. Brown's Special appears to be most promising of the two. Market Champion is characterized by a large, hard core, which is undesirable from the canner's viewpoint.

Marglobe, Brown's Special, Tri-State Baltimore, and Greater Baltimore ranked, in the order listed, for actual dollar value of the crop at Ridgely. The rank at College Park was Brown's Special, Pritchard, Greater Baltimore, and Marglobe.

These trials will be continued this year. There appears to be no variety which, at the present time, can replace Marglobe and Greater Baltimore for canning purposes.

Factors Affecting Canning Quality in Tomatoes

by

H. B. Cordner, University of Maryland

A study of some of the factors affecting the development of color in tomatoes is being conducted by the Department of Horticulture. The results of this study are to be used as a basis for this report. In general two factors have been recognized as having a marked influence on the final color of manufactured tomato products.

The first, timely harvesting, can not be over emphasized. The red coloring substance develops in tomato fruits during the late stage of ripening and seems to require a relatively long period of time to reach its maximum intensity. Under average field conditions it is not practical to delay harvest until the maximum quantity of the red pigment is developed because of loss of fruits resulting from cracking and rotting. Thus two things are to be avoided, premature harvesting which results in a poor

colored product and delayed harvesting with the usual spoilage loss. This requires good judgment on the part of the picker which is acquired only by experience and training.

The temperature of tomato fruits as they ripen in the field is recognized as another important factor. Tomatoes exposed to direct sunlight are heated to rather high temperatures which may result in definite tissue injury or sunscald and further coloring is prevented. Observations show that even in the absence of sunscald high day temperatures reduce the final color of tomato fruits. This appears to be the result of retarded formation of the red color.

Tomatoes shaded by the foliage do not heat up during the day as do those in the sun and ripen with a decidedly better color. Thus, the most practical means of improving color in tomatoes is found in improvement of the foliage of the plant.

The results of the study up to the present time indicate that there are varietal differences in the color of our standard varieties. These differences are small in comparison to those arising as a result of environmental factors and are in part associated with differences in vine and foliage characteristics.

Tomato Plant Certification in Georgia

by
Tom O'Neill, Office of Georgia State Entomologist

Tomato plants have been shipped to the North from Georgia for the last 15 years -- the amount increasing each year. About 10 years ago, complaints were made that the plants were often diseased. Thorough investigations proved the trouble to be in seed-borne diseases.

At the present time, Georgia requires that seed planted must be state certified seed, and that they come from a state whose certification is good.

Plants are usually grown on a sandy loam soil. Seed is sown in rows 16 inches apart, and 20 to 22 seed dropped per linear foot. This requires $3\frac{1}{2}$ - $4\frac{1}{2}$ pounds of seed per acre, and should produce approximately 100,000 plants. Plants are pulled by trained men, who get only the better ones. Plants are kept in the shade, taken to the packing house, and shipped the same day that they are pulled.

Disinfection of seed with 1:3000 $HgCl_2$ is required. Semesan dust is also sometimes used at planting time.

Plants are sprayed when 3 to 4 inches high with 3-4-50 Bordeaux and $1\frac{1}{2}$ pounds of lead arsenate. A second spray is generally put on 10 days later, sometimes followed by a third one after 10 days.

The principal disease is stem canker, or collar rot. Fusarium wilt is apparently not present. Early blight is sometimes present.

Before plants will be certified in Georgia the following requirements must have been met:

(1) Plants must be produced from certified seed.
(2) They must be produced on land inspected by the Georgia Station. Tomato plants can not be grown on the same soil in successive years, nor can they follow related crops of the night-shade family.
(3) Spray program must be followed.
(4) Plants must be field inspected and pronounced free from visible evidence of disease.

Field Changes in Grades of Tomatoes During Ripening

by

H. A. Hunter, University of Maryland

Limited studies have been conducted in Maryland during the last three years to determine the percentages of tomatoes which will ripen to the different grades under field conditions. All of the tomatoes on a selected number of plants were tagged before they reached the No. 2 stage. The condition and grade of each tomato was recorded weekly. The fruit was not picked until it deteriorated to the cull grade. The following table shows the percentage, by number rather than weight, of tomatoes reaching each grade for the 3 years.

	1932	1933	1934	Average
	%	%	%	%
No. 1's	63.4	23.3	19.4	35.4
No. 2's	26.8	32.4	23.2	27.5
Culls	9.8	44.3	57.4	37.2

The varieties used were: 1932, Hybrid No. 4; 1933, Marglobe; and 1934, Tri-State Baltimore. The plots were on land of only average fertility in 1932 and 1934, and on somewhat better than average land in 1933. The records for the three years involve a total of 2,293 individual tomatoes.

The results for the last two years should not be considered as normal, due to the exceptionally unfavorable seasons of heavy rainfall. The results for 1932 would probably more nearly represent average conditions.

The principal causes of No. 2 and cull tomatoes were rots, cracks, and sunscald, in the order named. Rots were far more important than all other causes combined.

Inasmuch as it would be impossible under field conditions to pick all tomatoes at the highest grade obtainable, this work indicates that the average grower, during this period, could not deliver a high percentage of U. S. No. 1 tomatoes without leaving a significant part of his crop in the field.

Much more extensive work along this line was conducted at the Indiana Experiment Station over a five-year period. The average grades reached were 68.3% No. 1's, 20.8% No. 2's, and 10.9% culls.

Buying Tomatoes on U. S. Grades. Is the Trouble with the Grades or the Canners?

Led by

F. M. Shook, Tri-State Packers' Assoc.

Maryland canners have been accepting low quality tomatoes on the flat-rate basis. According to studies conducted by the Department of Markets at factories buying on the flat-rate basis, both contract and open market, the percentage of culls was 40% in 1933 and 29% in 1934. These culls were paid for at the prevailing rate for canning tomatoes.

Basing calculations on the results secured by the Department of Markets in inspection of tomatoes at 28 factories over the last three-year period, using the common 75% and 150% differential for No. 2 and No. 1 tomatoes and an assumed flat-rate price of 20 cents per basket, these canners secured 810,052 baskets of tomatoes for $10,300.20 less than the flat-rate price. The following table shows the quality of tomatoes bought on grades during the last two years and the quality bought on the flat-rate basis, according to the studies of the Department of Markets.

Year	Method of buying	Percent		
		U. S. No.1's	U. S. No.2's	Culls
1933	Grade	28.1	61.7	10.2
	Flat rate	25	35	40
1934	Grade	43.6	50.8	5.6
	Flat rate	27	44	29

This shows that the grower selling on the basis of grades left a considerable part of his bad tomatoes in the field instead of delivering them to the cannery, and, in addition, he received less money per ton for those he did deliver than the grower who sold on the flat-rate basis and delivered a high percentage of culls.

One canner bought on the basis of grades on the open market and paid a differential of 90% for 2's and 150% for 1's, according to the open market price for each day. Even at this differential he secured the tomatoes cheaper than the open-market, flat-rate price.

It isn't logical that the grower is going to be enthused about selling on the basis of grades as long as poorer quality tomatoes bring a higher price on the flat-rate basis. If canners want tomato grading with the resulting better quality, to succeed in Maryland, they will have to either pay more on the basis of grades or less on the flat-rate ungraded basis.

Grading Studies on Corn and Tomatoes

by

E. P. Walls, University of Maryland

Corn: Attention was called to the fact that at the request of the Tri-State Packers' Association, work had been carried on by the State Department of Markets in 1932, 1933, and 1934 at seven canneries in Maryland, grading samples of sweet corn as delivered to these factories. The sampling period extended from the first part of the season to the end of the canning period and each of the canneries included in any one year was visited at various times throughout the season. In this way it is believed that the results obtained are representative of the quality of sweet corn of a particular variety at a certain cannery for that year and that the average results of all canneries for any year are quite representative of the quality of Maryland sweet corn in a given season.

The basis of grading has been the tentative grades for sweet corn for canning, suggested by the Bureau of Agricultural Economics, U. S. D. A.

Three of the seven canneries used in these studies can whole-grain corn and four can cream-style corn. Three are located on the Eastern Shore and four on the Western Shore. Altogether, 277 samples, aggregating 13,977 lbs., were graded. In summarizing the results for the three years, it was found that weighted averages for all varieties at all canneries gave 35.6 per cent of No. 1 milk stage, and 9 per cent No. 1 early dough stage; 11 per cent No. 2; 11 per cent culls; and 33.4 per cent husks.

The following summary shows the percentage of husked ears contained in each of the several groups, based on weighted averages of all varieties at all canneries for the three years:

No. 1 - Milk Stage	53.5%
No. 1 - Early Dough Stage	13.4%
No. 2	16.6%
Culls	16.5%

It is believed that the above summaries of three years' work conducted throughout the seasons at seven canneries located geographically so as to give a wide range of climatic and soil conditions are quite representative of the quality of Maryland sweet corn. Any canners who are desirous of making purchases of sweet corn on the basis of grades or who wish to conduct further investigational work along this line, will receive the fullest possible cooperation from the State Department of Markets.

Tomatoes: In order to get an accurate idea of the quality of tomatoes delivered at canneries not purchasing raw stock on the graded basis, studies were made in 1933 and 1934 at canneries located in various parts of the tomato growing section of Maryland. Actual samples were taken and graded according to U. S. grades. Sampling was done at various times from the beginning to the end of the season, and damage from rains and storms was also noted.

The weighted averages for the two years for all canneries visited give the following results:

Buying Tomatoes on U. S. Grades. Is the Trouble with the Grades or the Canners?

Led by

F. M. Shook, Tri-State Packers' Assoc.

Maryland canners have been accepting low quality tomatoes on the flat-rate basis. According to studies conducted by the Department of Markets at factories buying on the flat-rate basis, both contract and open market, the percentage of culls was 40% in 1933 and 29% in 1934. These culls were paid for at the prevailing rate for canning tomatoes.

Basing calculations on the results secured by the Department of Markets in inspection of tomatoes at 28 factories over the last three-year period, using the common 75% and 150% differential for No. 2 and No. 1 tomatoes and an assumed flat-rate price of 20 cents per basket, these canners secured 810,052 baskets of tomatoes for $10,300.20 less than the flat-rate price. The following table shows the quality of tomatoes bought on grades during the last two years and the quality bought on the flat-rate basis, according to the studies of the Department of Markets.

Year	Method of buying	Percent		
		U. S. No.1's	U. S. No.2's	Culls
1933	Grade	28.1	61.7	10.2
	Flat rate	25	35	40
1934	Grade	43.6	50.8	5.6
	Flat rate	27	44	29

This shows that the grower selling on the basis of grades left a considerable part of his bad tomatoes in the field instead of delivering them to the cannery, and, in addition, he received less money per ton for those he did deliver than the grower who sold on the flat-rate basis and delivered a high percentage of culls.

One canner bought on the basis of grades on the open market and paid a differential of 90% for 2's and 150% for 1's, according to the open market price for each day. Even at this differential he secured the tomatoes cheaper than the open-market, flat-rate price.

It isn't logical that the grower is going to be enthused about selling on the basis of grades as long as poorer quality tomatoes bring a higher price on the flat-rate basis. If canners want tomato grading with the resulting better quality, to succeed in Maryland, they will have to either pay more on the basis of grades or less on the flat-rate ungraded basis.

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The weighted averages for the two years for all canneries visited give the following results:

Year	No. of Factories	No. of Samples	Per Cent U. S. No. 1	U. S. No. 2	Culls
1933	12	41	25	35	40
1934	15	121	27	44	29

The quality of tomatoes delivered to canneries buying on the basis of U. S. grades during the same period is shown below:

Year	No. of Factories	No. of Bushels	Per Cent U.S. No. 1	U. S. No. 2	Culls
1933	5	234,206	28.1	61.7	10.2
1934	14	507,635	43.6	50.8	5.6

Experimental Work on the Corn Ear Worm and Vinegar Gnat

by

E. N. Cory and L. P. Ditman, University of Maryland

Corn Ear Worm: Injury from the corn ear worm was less in 1934 than in the two preceding years. Observations of injury on various varieties showed Golden Cross Bantam to be less injured than other Golden Bantam types.

There have been several favorable reports with the use of poison spray baits for control of the corn ear worm. Because of these results, work was begun at the Maryland Station two years ago to determine the most attractive sugar and the minimum concentration at which it is effective, as well as the poison which would be most suitable for the bait.

It was found that sucrose (cane sugar) was most attractive, and attractive at a lower concentration than any other sugar. Poisons used were sodium arsenite, tartar emetic, thallium sulphate, sodium fluoride, and pyrethrum. Sodium arsenite appears to be the most satisfactory. Indications are that 10 to 15 pounds to 50 gallons of water will be necessary to kill ear worm moths in a minimum length of time. One type of feeding trap which we have made has been observed in the field; when baited with a fermenting mixture and a poisoned invert sugar solution, moths of all descriptions were attracted to it and fed in large numbers. In view of the results of laboratory work we believe there is a good chance of killing moths with poison bait traps.

Vinegar Gnat: Field infestation began early and remained high throughout the season. Factory infestation was uniformly low. Set-ups which had been put in for control of the gnat were no doubt partly responsible for this. Factory infestation was higher late in the season.

Inefficient culling is the most important cause of gnat infestation. A long belt must be used and culling done thoroughly. No type of washer will remove larvae from the tomatoes. Better raw stock will aid greatly in keeping down infestation. Few, if any, farmers deliver gnat-free tomatoes.

Pea Aphis: Three years of control work have been completed in Garrett County, where the aphis is a serious pest. A spray of 1:500 Black Leaf 40, and 4 pounds of fish oil soap is best. Spraying should be done at blooming time. It may be necessary to make two sprays -- one a little earlier than this. Cost per acre for material and application is about $1.75.

Breeding and Development of Hybrid Sweet Corn in Connecticut

by

W. R. Singleton, Connecticut Experiment Station

Development of desirable sweet corns necessitates selection for (1) Yield, (2) Uniformity, and (3) Quality. Disease resistance is often an important factor in yielding capacity. Golden Cross Bantam, for example, is resistant to wilt, and is an outstanding sweet corn in Connecticut. Uniformity of ears is especially important when the canner is putting up a whole grain pack. For a corn to possess high quality it must (1) have a tender pericarp, (2) be high in sugar content, and (3) have a good flavor.

Crossing of field corns with sweet corn to secure certain desirable characteristics has not been successful in Connecticut.

Self-pollination is, of course, necessary in inbreeding, and both ear and tassel must be bagged, for foreign pollen may lodge on tassels.

Top cross corns are obtained by crossing an inbred with the open pollinated variety. The so-called hybrid sweet corns are obtained by crossing two inbreds. Two inbreds, when crossed, give vigor and high yield. When corn is selfed it continues to get smaller.

The usual ratio of seed plants (detasseled) to male plants is 3:1, for production of top cross sweet corn seed.

Some of the outstanding varieties developed in Connecticut have been:

(1) Connecticut No. 6 - a whipple hybrid.
(2) Spanish Gold - especially valuable for breeding purposes, and is widely used.
(3) Whip Cross P-39 - three days earlier than Golden Cross Bantam. This variety may be valuable to canners.

Yields of corn are uniformly higher in Connecticut than anywhere in the United States. This is due mainly to its peculiar climatic conditions. It has been found that corns which grow well in hot, dry regions will do even better in Connecticut. Corn taken from Connecticut, however, to some of the hot, dry regions will not grow well.

The More Promising Strains and Hybrids of Sweet Corn For Canning in Maryland

by
R. G. Rothgeb, University of Maryland

In order to obtain information useful alike to sweet corn growers and seedsmen, annual field trials are being conducted jointly by the Experiment Station and the Extension Service of the University of Maryland. Due to the existence of many strains of established types, together with the development of an increasing number of hybrids, it seems advisable to have available up-to-date performance records for Maryland.

Various varieties, strains and hybrids have been grown in replicated plats on the same farm at College Park for the past four years. The number of stocks tested has varied from thirty-six in 1933 to sixty-five in 1931. Seed samples have been furnished by other experiment stations, seedsmen, and individuals interested in the improvement of sweet corn. A report including all the entries has been mimeographed and distributed.

Observations Based on the Trials: Many hybrids which do well in other parts of the country are not adapted to Maryland. It is just as necessary, if not more so, to test hubrids as it is varieties.

Home grown seed has yielded somewhat better than northern grown seed. As a rule stocks developed in the mid-west have shown good vigor in Maryland.

In general late varieties have been more productive than early varieties. Evergreen and Country Gentleman belong to the former group, and serve as standards of comparison for new material.

Adapted first generation hybrids are more uniform in maturity than open pollinated varieties. However, the uniformity of hybrids may have no practical benefit if the crop is being grown in a field which varies greatly in soil fertility.

No Stowell's Evergreen or Country Gentleman hybrids have been tested which have consistently out-yielded good open pollinated stocks. However, several Narrow Grain Evergreen hybrids have shown high yields and good quality for two or more years. Asgrow 26.15, especially, has promise.

In 1934 a yellow Country Gentleman hybrid (Asgrow Golden Colonel) performed equally as well as commercial stock.

Golden Cross Bantam has done well for four years. In yield of marketable ears it has compared favorably with Evergreen and has far surpassed 8-row Golden Bantam. It is recommended to the grower who desires a yellow corn having short fodder, excellent canning quality, and maturing a week to ten days earlier than Evergreen. Seed is being produced in quantity by a number of seedsmen. One of the inbred parents is being used to good advantage in several yellow top crosses. One such top crossed Bantam performed about as well as Golden Cross Bantam in 1934. Similarly, top crossed Spanish Gold gives promise as a seventy day yellow hybrid. Other material has possibilities but has not been tested sufficiently for definite conclusions.

The following table compares Golden Cross Bantam with three varieties. The data represent averages for four years, 1931, 1932, 1933 and 1934.

	Golden Bantam	Golden Cross Bantam*	Stowell's Evergreen	Country Gentleman
Stand - Percentage	83.0	92.8	89.2	87.3
Days to silking				
First plant	54.0	56.8	60.0	62.5
50% of plants	57.3	59.0	66.3	65.5
Plants smutted - Pct.	10.2	5.1	5.8	4.6
Plants dying - "	16.7	1.6	1.4	.0
Plant height - inches	61	68	88	88
Ear Length - inches	7.1	7.9	8.1	7.7
Good ears per plant	.9	1.4	1.0	1.2
Tons per acre - total	1.58	3.18	3.29	2.90
Husk and cull loss - Pct.	55.7	45.0	44.6	41.7

*
Tests out in the State conducted in 1934 confirm College Park records on Golden Cross Bantam. Such tests will be continued in 1935.

New Developments in Pea Breeding

by

C. E. Temple, University of Maryland

At the present time selection of peas for heat and drought resistance, and root-rot resistance is being made. It now seems very likely that resistance to root-rot will be secured. This work is now being carried on in greenhouses, and it appears promising.

In making selections for new varieties the following factors must be borne in mind: resistance to disease, strong root system, drought resistance, and high quality.

Tests of New Varieties of Peas

by

W. A. Frazier, University of Maryland

These tests are being run to (1) eliminate the less desirable of the Alaska Strains, and (2) to find a high quality, sweet type of pea which could profitably replace the Alaska. Tests in 1934 included the following varieties:

(1) Rogers A - a sweet, wrinkled, small podded type. It has proved to be very heterogeneous and so has been discarded.

(2) Wisconsin Early Sweet - a sweet, wrinkled, small podded, wilt-resistant type, of the same earliness as Alaska, and of distinctly higher quality.

(3) Resistant Gem - a sweet, wrinkled, small podded, wilt-resistant type, four or five days later than Alaska.

(4) Associated Seed Co. Strain 5 of Alaska - resistant to wilt.

(5) Maryland Alaska - original Maryland Alaska, seed of which were multiplied in the west.

(6) Susceptible Alaska - old Alaska strain, susceptible to wilt.

(7) Alaska HF 30-1 a recent, vigorous Alaska selection, resistant to wilt.

The varieties were planted at College Park and Ridgely. At College Park, the Wisconsin Early Sweet yielded higher than all other varieties in the test, with no significant differences between the other varieties. At Ridgely, the Susceptible Alaska strain yielded very low. Yields of Associated Seed Company Strain 5 of Alaska, and Alaska HF 30-1 were consistently high at both locations.

It would seem that Wisconsin Early Sweet is the one highly promising sweet type of pea for Maryland canners. We, by no means, would advise substituting it entirely for Alaska, but it seems that canners would do well to give it a small scale trial. Cool weather during the latter part of the growing period last year was highly beneficial to the sweet varieties. These tests have been run, on an extensive scale, for only one year, and it is known that data on varieties must be collected over a series of years, to be of practical importance.

SUMMARY OF PEA VARIETY TESTS

1934

Yields in pounds per acre

	College Park	Ridgely - small plots	Ridgely - demonstration	Westminster	Mountain Lake Park	Rehoboth	Average
Rogers' A	1420	3033	3512	977		2513	2291
Wisconsin Early Sweet	1920	2888	4528	1173	1515	2763	2465
Resistant Gem	1502	2611	3657	751	2200		2141
Alaska - Strain #5	1607	2724	3131	1284		2777	2305
Md. Alaska - Assoc.	1430	2722	2813	1296	1160	2888	2052
Susceptible Alaska	1481	2286	3594	1779	2150		2258
Alaska - HF 30-1	1637	2988		1856	858	3597	2187
Alaska - HF 30-3			3485	2068	2815		2789
Md. Alaska - # 126			2959	1738	2690		2462
Md. Alaska - Sioux City				1891		3062	2477
Alaska - 66456				1443			1443
Alaska - 66465					3080		3080
Alaska - M-3011					2480		2480
Alaska - 66508						2659	2659
Asgrow Resistant Alaska						2729	2729
Average	1571	2750	3460	1478	2105	2874	2388

SOURCE OF SEED

Rogers' A -- Rogers Brothers Seed Co.
Wisconsin Early Sweet -- Associated Seed Growers
Resistant Gem -- Associated Seed Growers
Alaska - Strain #5 -- Associated Seed Growers
Md. Alaska - Assoc.-- " " "
Susceptible Alaska -- " " "
Alaska - HF 30-1 -- University of Md. and Crites-Moscow Growers' Assoc.
Alaska - HF 30-3 -- " " " " " " " "
Md. Alaska - #126 -- " " " " " " " "
Md. Alaska - Sioux City -- Sioux City Seed Company
Alaska - 66456 -- Associated Seed Growers
Alaska - 66465 -- " " "
Alaska - M-3011 -- Crites-Moscow Growers' Assoc.
Alaska - 66508 -- Associated Seed Growers
Asgrow Resistant Alaska -- Associated Seed Growers

Yields expressed as percentage of the average yields for each plot of Wisconsin Early Sweet and Maryland Alaska (Associated).

	College Park	Ridgely - small plots	Ridgely - demonstration	Westminster	Mountain Lake Park	Rehoboth	Average
Rogers' A	85	108	96	79		89	91.4
Wisconsin Early Sweet	115	103	123	95	113	98	101.2
Resistant Gem	90	93	100	61	165		101.8
Alaska - Strain #5	96	97	85	104		98	96.0
Md. Alaska - Associated	85	97	77	105	87	102	92.2
Susceptible Alaska	88	81	98	144	161		114.4
Alaska - HF 30-1	98	106		150	64	127	109.0
Alaska - HF 30-3			95	168	210		157.7
Md. Alaska - #126			81	141	201		141.0
Md. Alaska - Sioux City				153		108	120.5
Alaska - 66456				117			117.0
Alaska - 66465					230		230.0
Alaska - M-3011					186		186.0
Alaska - 66508						94	94.0
Asgrow Resistant Alaska						97	97.0

Yields expressed as percentage of the average yields for each plot of Rogers' A, Wisconsin Early Sweet, Strain No. 5 and Maryland Alaska (Associated). The tests at Mountain Lake Park and Westminster are omitted.

	College Park	Ridgely - small plots	Ridgely - demonstration	Rehoboth	Average
Rogers' A	89	107	100	92	97.0
Wisconsin Early Sweet	120	102	130	101	113.3
Resistant Gem	94	92	105		97.0
Alaska - Strain #5	101	96	90	102	97.3
Md. Alaska - Associated	90	96	81	106	93.3
Susceptible Alaska	93	80	103		92.0
Alaska - HF 30-1	103	105		131	113.0
Alaska - HF 30-3			100		100.0
Md. Alaska - #126			85		85.0
Md. Alaska - Sioux City				112	112.0
Alaska - 66508				97	97.0
Asgrow Resistant Alaska				100	100.0

EXTENSION SERVICE
UNIVERSITY OF MARYLAND
and
UNITED STATES DEPARTMENT OF AGRICULTURE, COOPERATING
T. B. Symons, Director
Approved by the Departments of Entomology and Plant Pathology - May, 1934

SPRAY PROGRAM FOR CANTALOUPES, CUCUMBERS AND WATERMELONS

Materials

Liquid Spray:

Bordeaux mixture plus arsenate of lead:

Bordeaux: 2 lbs. copper sulfate (bluestone) powdered or lump; 4 lbs. stone lime or 6 lbs. high grade spraying hydrated lime; 1½ lbs. arsenate of lead; 50 gallons of water. The lump bluestone may be dissolved by suspending it in a bag near the surface of a few gallons of water contained in a wooden or earthen vessel. The powdered bluestone will dissolve immediately in water and for this reason has been found more desirable than the lump. Slake the lime and add a few gallons of water so as to make milk of lime. Pour the bluestone into the spray tank and add enough water to make 40 gallons; then strain the milk of lime into the tank while agitating the mixture vigorously. Add water to make 50 gallons. Put in the 1½ lbs. of arsenate of lead last and just before beginning to spray.

Instant Bordeaux plus arsenate of lead:

Two lbs. pulverized copper sulfate, 6 lbs. high grade spraying hydrated lime; 1½ lbs. arsenate of lead; 50 gallons of water. Place the hydrated lime on the screen and wash it into the tank. Keep the agitator going throughout the entire mixing process. Add water until the tank is about three-fourths full and place the pulverized copper sulfate on the screen. Wash this into the tank until the tank is full. Put in the 1½ lbs. of arsenate of lead last and just before beginning to spray.

Dusts:

In general, dusts have not given as good results as the liquid spray due largely to their inferior sticking qualities; however, dusts containing from 15 to 20 percent monohydrated copper sulfate and an equal percentage of calcium arsenate with hydrated lime as the carrier have given, under most conditions, good commercial control. These dusts are available on the market as copper-arsenic-lime dusts 15-15-70 or 20-20-60 strength. The former is the safer mixture. Use about 20 lbs. per acre. In general, it is advised that factory mixed dusts be purchased unless a self-mixing duster can be used. In all cases purchase the best materials available. This applies equally to spraying materials.

Time to Apply

Begin spraying or dusting operations when the vines begin to run and repeat the applications at weekly or ten-day intervals depending on weather conditions. The more frequent applications should be made during cloudy weather. Usually five applications are sufficient. Arsenate of lead should be omitted after the vines have begun to fill the rows.

Insect Notes:

If striped cucumber beetles appear in injurious numbers before the first application is recommended, dust the young plants with a mixture of one pound of calcium arsenate and fifteen pounds gypsum (land plaster) or apply either of the above spray or dust materials.

A close vigilance should be kept over the crop at all times for aphid (lice) outbreaks. Since they usually appear in definite spots over the patch, spot dusting with a 3% nicotine dust, or spraying with nicotine sulfate (Black-Leaf-40) 1 pint to 100 gallons of water, or Bordeaux will give control before the insects have spread over the entire field. A 3% nicotine dust may be made by mixing $7\frac{1}{2}$ pounds of Black-Leaf-40 in 100 pounds of hydrated lime. This may be mixed in a barrel mixer or in a large metal friction top can, containing a dozen or more 2-3" round stones, rolled continuously for 15 minutes over rough ground.

Great precautions should be used in handling and storing any arsenical or nicotine sprays or dusts. Either is poisonous.

The squash vine borer, the larva or worm stage of a moth, bores into the stems. The eggs are laid on the stems. The borers can be cut out with a sharp knife by making a slit lengthwise of the stem. Afterwards the earth should be mounded up over the cut.

The pickle worm moth lays its eggs on the new shoots. The worm feeds there for a short time and then bores into the fruit. Early spraying according to the above schedule will tend to reduce its numbers.

5/1/34
MLO

SUMMARY OF MINUTES OF BROCCOLI CONFERENCE

COURT HOUSE, SALISBURY - Feb. 13, 1928

The Broccoli Conference was attended by about 200 growers, dealers, truck operators, and transportation officials. A few women were present.

The proceedings were opened with some introductory remarks by Dr. F. B. Bomberger, Director of Marketing Bureau of the Del-Mar-Va Eastern Shore Association, who was then elected Chairman of the Conference.

Discussion of the topic, "Local Experience in Growing Broccoli", was opened by Mr. W. O. Strong, County Agent of Accomack County, Va., who gave a detailed account of experiments in Virginia in an effort to determine varieties. He said they had secured seed of the genuine Italian broccoli at $30.00 per pound, but that this is a fall and not a spring crop and hence not adapted to this section. Three other varieties of broccoli, more like the type grown here as a spring crop, were also secured. He said that the Virginia growers pack largely in hampers and their main product resembles turnip top greens. Seed is planted late in August or early September, usually broadcast, but it would probably be better to plant it in rows. One hundred pounds of 5-6-5 fertilizer is used, with a top dressing of 200 pounds of nitrate of soda in the spring.

Mr. George R. Cobb, former County Agent of Wicomico County, continued the discussion. He said that he had learned of the broccoli crop from Mr. Thomas D. Thomas of Laurel, Delaware, who was the pioneer grower in this section. The acreage has increased very fast in the last two or three years. He assisted in organizing a local Broccoli Association in Wicomico County. The Association could not make money shipping in hampers, and followed the practice of tying stalks in bunches, weighing about 1-1/2 pounds each, which were packed in crates, 24 bunches to a crate. The Association had had some costly experience with carlot shipments, having lost heavily on two cars, due probably to the fact that the cars were loaded too solidly and too heavily.

He said the seed was sown the last of August. A top dressing of 200 pounds of nitrate of soda was applied in the spring. Suggested that a complete fertilizer should be used instead. Cutting begins about March 25. Best time to cut is just before the blossoms start to open. Bundles were cut off even with top of crate and cut tight. When growers received less than $2.50 per crate, they ceased cutting.

Mr. Thomas D. Thomas, of Laurel, Delaware, told of getting the seed for his first crop about five years ago from New Jersey. The first year it yielded $700 per acre. He then increased his plantings and furnished seed among neighbors. He said that the New York and Philadelphia markets are being glutted and that plans must be made to distribute the crop in refrigerator cars to other markets. He advocated the use of a crate holding about 18 bunches, weighing 1½ pounds each. The cantaloupe crate or green tomato crate with 15 to 13½ inch head and 22 inches long is about right, he thought. He uses 150 pounds of nitrate of ammonia as top dressing, but thinks sulphate of ammonia is better. Rows are 32 inches apart. He emphasized the use of ice to insure good condition during transportation.

Mr. Sanguinetti, from New Jersey, strongly advocated the use of ice in shipment. Can be shipped by truck if properly iced. Danger in truck shipment is from wilting on account of air blowing over crates. He uses chiefly hampers, but is now beginning to use Florida pepper crates. Ice is put directly into the hampers.

The larger stalks, if crisp, bring the best money. He recommended planting smaller acreage and fertilizing it highly rather than growing a large acreage and giving it little attention. Liberal application of nitrate of soda continues the growth of good quality stalks even after it has been cut several times. Stalks must grow fast to be tender. Advises against using wet moss in the crate. Depends on ice and low temperature to prevent wilting.

Mr. L. S. Weber, Division Freight Agent of the Pennsylvania Railroad, from the Wilmington office, said that the railroad would arrange to carry broccoli in refrigerator cars if desired by growers and shippers. Minimum carload would be 20,000 pounds. The rate for shipments, fully iced from central points such as Laurel, Delaware, to Jersey City, with 500 crates to the car lot, would be 25-7/10 cents a crate; or packed less solidly, with 450 crates to the car, at about 28⅔ cents per crate. The cost of re-icing when diverted, or going to more distant points, could not at this time be determined.

Questions by Mr. G. S. Ralston, of the Eastern Shore of Virginia Produce Exchange, brought out the point that the actual rate would probably be somewhat higher per crate, because it would be very likely not be practicable to load the minimum weight in the car.

Mr. R. G. Hill, of the U. S. Bureau of Agricultural Economics, discussed the "Experience of Some other Regions of the U. S. with Broccoli". Broccoli has been grown in New Jersey for several years very successfully. The sprouts are much liked by the Italian race. In Italy there are forty species of broccoli, the word itself meaning

"sprouts" in the Italian language.

Consumers demand fresh stalks of good color. This demands refrigeration and ice in shipping. Packing in crates prevents bruising. Air circulation and ventilation must be provided. The crop must be cut in the right stage and ice in the packages is frequently used.

Crates in cars should be spaced several inches apart and stripped so that each layer of crates does not rest directly on another. Crates should not be too large. As broccoli continues to grow in transit, the stock must be cut in time to allow for this growth and development on the way to market, or it will flower enroute. He concluded that more broccoli than spinach is being used in the United States today.

Mr. Carbone of Carbone Bros. & Co., of New York, who are large broccoli distributors, said that his firm had about 400 acres of broccoli in North Carolina. All shipments are in refrigerator cars and top-iced. Shipments have arrived in Chicago and St. Louis in good shape. About 450 crates are loaded to the car. A new crate, now used, has a 14 inch head with solid bottom and holds 18 bunches. Crates are spaced in the car and stripped. Two and a half tons of ice are placed on top of crates. No ice is used in the crates. Blocks of ice are better than small lumps as the ice melts less slowly.

Representatives of the Marvil Package Company and C. R. Disharoon Company, package makers, said they were prepared to make such types of crates as the growers may require.

Professor F. W. Geise of the University of Maryland, discussed the topic, "How Can Reliable Seed be Secured?" In the selection of seed, he said, one must take into account market requirements. Seeds from various sources should be tested. Select the best type and grow only the variety and type giving best results.

Seed selection can best be done collectively, and should be carried on in cooperation with the Extension organizations and Experiment Stations of the several states. He discussed the splendid results obtained by the Tri-State Packers Association in developing standardized varieties and reliable seed for the members of the Association. Similar methods could be followed by broccoli growers if they desired to do so.

In answer to a question, Mr. W. O. Strong said that in Virginia some growers select a few of their best plants and transplant them into a seed plot in the spring in order that they may mature seed without too much mixture from the other plants in the field.

Mr. Lee Hayman, representing the Wicomico Broccoli Association, then discussed the activities of this organization. He said that successful shipments had been made by truck to New York and Philadelphia. Extra ice was used in shipments carried over an extra day.

Mr. Harry Rounds and Mr. Harry Hill, who have had extensive experience in truck transportation, said that ice is necessary in such shipments and that the crop should not be hauled uncovered.

Mr. R. C. Dennis of New Jersey, who has had success in growing broccoli, said that he had purchased a tying machine at a cost of $75.00, which had more than paid for itself. The sooner the stalks are bundled and packed in crates the better the crop will carry.

Mr. H. R. Neamond, of the American Railway Express Company, discussing transportation said that his company had carried broccoli as far as Boston successfully. It was iced and cost 80 cents per crate for transportation.

Mr. Harry Phillips, Hurlock, Md., said that he had successfully shipped small lots by freight to New York and Philadelphia.

Mr. E. M. Nichols, Freight & Passenger Agent, B.C.&A Railroad at Salisbury, said that second morning delivery to New York and Philadelphia could be given by rail. He advocated crates with slatted tops.

Dr. F. B. Bomberger, Director Del-Mar-Va Marketing Bureau, in discussing the question, "Is Organization of Broccoli Growers Desirable?", suggested the possibility of attaining some or all of the following results through organization:

1. Standardization of Variety.

This could be worked out by an association of growers in cooperation with the Experiment Stations and Extension organizations on the Peninsula. It would require testing of many varieties and strains in order to determine which produce best results. The Marketing Bureau of the Del-Mar-Va Association would be glad to cooperate in this work.

2. Establishing Sources of Reliable Seed.

This would require action by an association of growers working in cooperation with Extension and Experiment Station agencies. The success of the efforts of the Tri-State Packers Association in developing supplies of seed

from tested varieties and strains of tomatoes for canning is an evidence of what might be done with broccoli. The Del-Mar-Va Association could cooperate in such a program.

3. Advertising Broccoli in New Markets.
This could be done in cooperation with the Del-Mar-Va Association which has already issued, in cooperation with dealers, illustrated pamphlets relating to strawberries, apples, peaches, cantaloupes, Irish potatoes and sweet potatoes. Many cities of 100,000 population and upwards, which are unfamiliar with broccoli, might readily be induced to buy it. An association is necessary to sponsor such advertising.

4. Standardization of Packages.
An association of growers could work out this problem in cooperation with the marketing agencies of the Peninsula and the U. S. Department of Agriculture. The Marketing Bureau of the Del-Mar-Va Eastern Shore Association could help with this project.

5. Standardization of Loading and Icing of Cars.
An association of growers is obviously necessary in undertaking such a project as this. Different methods of loading and icing would be tried out and the results would eventually indicate the best plan. Such a project should be carried on in cooperation with marketing agencies of the several states on the Peninsula and with the U. S. Department of Agriculture. The Del-Mar-Va Marketing Bureau could assist with this project.

6. Selling the Broccoli Crop.
Sooner or later the growers of this crop will be driven to use some sort of cooperation or coordination of effort in the marketing of this crop. Without any direction from a growers organization each grower or group of growers is competing with every other. No one knows of the marketing plans of the others, and hence there is a likelihood that any or all markets may be glutted at any time. If the Del-Mar-Va Association can be of assistance in establishing some sort of cooperation or coordination of marketing activity, it will be glad to do so.

At the conclusion of Dr. Bomberger's address, it was moved, seconded and carried without a dissenting vote that the Chairman be authorized to name a committee to consider the practicability of forming an organization of broccoli growers for the purposes enumerated.

Members of the committee will be announced later.

Mrs A Rossing
2 Allendale Road
Hamilton P.O.
Balto

Egg masses

Mrs. Samuel Thackeray
Corbett. Md,
O.G.N.

Vegetable Calendar

John Hale
Towson
50 ↑
50 Parkville

Mimeo. Report No. 6 December 1931

NATIONAL RURAL ELECTRIC PROJECT

FARM RIPENING TOMATOES WITH ETHYLENE GAS

By B. B. Powell

In the fall of 1930 Mr. J. T. Seibel, cooperating with the National Project, ripened 82 baskets of tomatoes experimentally with ethylene gas. (A detailed report of the experiment was issued by the National Project December 10, 1930) Mr. Seibel was so well pleased with the operation and his net profit that he decided to try it again.

This year when frost was threatening on October 15 he picked 164 - 5/8 bushel baskets of green but practically mature tomatoes and placed them in his underground cellar. Thermostatically controlled electric heating elements for controlling the temperature were installed and a fan was provided for changing the air. Mr. Seibel purchased a 13 1/2 cu. ft. cylinder of ethylene gas, with a base plate and a special gas measuring valve from the Ohio Chemical and Manufacturing Company of Cleveland, Ohio. The complete outfit, including the 13 1/2 cu. ft. of gas, cost $20.00. The refill of gas cost $2.52.

The electrical equipment consisted of two 1000 watt Chromolox strip heaters controlled by a Lyon ether wafer thermostat in each line set to break at 70° F., and a 12" portable electric fan which was placed in the ventilator every second day to exhaust the spent air before administering a new charge of gas. (The cellar should be wired with No. 10 wire to avoid overload and excessive voltage drop.)

The underground fruit cellar having a volume of 1000 cubic feet was made air-tight by closing the openings with doors made of double matched lumber and building paper, and sealing them with clay. The required humidity was maintained by sprinkling water on the floor and by placing pails of water near the heaters.

The 164 baskets of green tomatoes were placed in the cellar October 16 and gas was injected October 20, and every second day thereafter until November 2 when the last of the tomatoes were removed.

The following table shows the removal of the tomatoes and the prices received:

Date	TOMATOES REMOVED					
	1st Grade		2nd Grade		Total	
	No baskets	Price	No baskets	Price	Value	Spoiled
Oct. 20	Started treatment					
Oct. 24	11	$1.60	5	$0.50	$20.10	
Oct. 26	22	1.55	12	.50	40.10	
Oct. 28	26	1.60	9	.50	46.10	
Oct. 30	12	1.50	6	.50	21.00	
Nov. 2	7	1.25	10	.50	13.75	
Total	78	$1.54	42	$0.50	$141.05	40

Four baskets of small immature, partially ripe tomatoes remained in the cellar.

The following table gives the costs and net profit:

164 baskets of green tomatoes @ 40¢	$65.40*
6 cu. ft. ethylene gas	1.25
Interest and depreciation on special equipment	2.00
30 hours of labor @ 35¢	10.50
2 extra trips to market	10.00
240 kwhr electricity @ 4¢	9.60
Total	$98.75

Received $141.05 less expense $98.75 = $42.30 net profit

There was also a saving of about $2.00 in baskets as 44 less baskets were required to deliver the tomatoes to market.

The expected frost was not severe and tomatoes continued to ripen in the field for two weeks. Mr. Seibel gathered 30 baskets of green tomatoes and 2 baskets of ripe ones from the field on November 2. This unusual ripening of tomatoes in the field so late in the season increased the local supply and kept down the price or the net profit would have been still more.

*Mr. Seibel stated he would have gladly delivered the 164 baskets of green tomatoes to the Washington market for $50.00.

SWEET POTATO GROWERS SHOULD 350506
USE CARE IN STEM ROT TREATMENT

For control of stem rot, Maryland sweet potato growers are advised to treat the lower ends and roots of sweet potato sprouts with organic mercury compounds, according to Dr. Robert A. Jehle, plant pathologist for the University of Maryland Extension Service. He says that tests, conducted by the University, have shown that 12 percent nitrophenol mercury combined with 5 percent chlorophenol mercury will give best results. No apparent injury to plants resulted from these experiments and in almost every instance the percentage of plants affected with stem rot was greatly reduced and the yield was increased by the treatment.

On the other hand, Dr. Jehle warns all potato growers to be careful in handling the material and not to get the solution on the leaves or upper parts of the plants. For this reason, he advises dipping the lower end of the sprouts into the solution to the ground line. Only a handful of plants should be dipped at one time, it is emphasized.

Dr. Jehle says that the importance of great accuracy in making the solution cannot be over-emphasized. The solution is made by diluting the 12 percent nitrophenol mercury and 5 percent chlorophenol mercury at the rate of one pound of chemical to ten gallons of water. (One pint dry measure holds one pound of chemical). In mixing these chemicals Dr. Jehle says that one should never guess, but should always measure and weigh carefully. In addition, all soil should be washed from the sprouts before treatment by dipping them in a pail of water.

Dr. Jehle or the county agent will be glad to give further information regarding treatment and where chemicals may be purchased.

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MARYLAND STANDARD ANALYSIS FERTILIZERS

Department of Agronomy - University of Maryland

Analysis	Total Units	Recommended for
2 - 9 - 5	16	Corn, late potatoes, fall seeded grains on the heavier soils and for legumes on unmanured soils.
2 - 12 - 4	18	Wheat, winter barley and corn on dairy farms and where fertilizer is divided between the grain crops. Late potatoes and grains on well manured loams and heavy soils.
0 - 12 - 5	17	Alfalfa, clovers, soybeans, cow peas, pasture on manured land, top dressing alfalfa, and on corn and grass land that is heavily manured.
2 - 8 - 10	20	Sweet potatoes on sandy soil with manure and for root crops such as carrots, beets, parships.
3 - 8 - 10	21	Sweet potatoes, carrots, parsnips, turnips, and other root crops without manure or legumes.
3 - 12 - 6	21	Sweet corn for canning house, on heavy soils and where manure has been used. Winter grains and late potatoes on light soils.
4 - 8 - 5	17	Sweet corn for market, asparagus, cannery peas and beans, cucumbers, cantaloupes, late potatoes and lima beans, and grains on sandy soils.
4 - 8 - 7	19	Tomatoes in rotation with field crops and after a green manure crop.
5 - 10 - 5	20	Pastures and turf grasses and leafy truck crops if more nitrogen and phosphorus are desired.
5 - 8 - 12	25	For vine crops - melons and cucumbers on light soils.
6 - 6 - 5	17	Early potatoes, asparagus, broccoli, and other truck crops.

Special Fertilizer Analyses for Tobacco *

4 - 8 - 12	24	Without either manure or legumes in the rotation and on rested land. Recommended application - 600 to 1000 pounds per acre.
2 - 8 - 10	20	With legumes or manure in the rotation. Recommended application - 600 to 800 pounds per acre.
6 - 6 - 8	20	For tobacco seed beds. Not less than 1 pound per square yard.

Analyses expressed as (N) Nitrogen, (P_2O_5) Phosphorus, and (K_2O) Potash.
* Potash from high grade sulphate of potash.

Notes.- The sale of mixed fertilizers containing a total of 24 or more units of plant food in multiples of the above ratios is permitted.

The above list of grades does not include topdressers, which, if offered for sale, shall not contain less than 9 per cent of nitrogen nor less than 16 per cent of total plant food.

Approximate Value in Pounds per Acre for Letter Symbols of Each Element Reported in Soil Test

Plant Food as Individual Elements	Pounds per acre of the elements as designated by the following letters								
	O	T	VL	L	L+	M	M+	H	VH
Nitrogen as Nitrate	None	4	8	15	20	30	40	50	75
Nitrogen as Ammonia	"	2	4	8	12	20	30	50	75
Phosphorus	"	5	10	20	30	50	80	150	250
Potassium	"	50	100	150	200	250	325	400	600
Calcium	"	200	400	800	1200	1600	2000	2400	3600
Magnesium (1)	"	--	16	25	40	60	75	150	250
Magnesium (2)	"	4	6	10	16	25	50	75	150
Manganese	"	4	8	12	16	28	40	60	100
Aluminum	"	10	25	50	60	100	160	250	500
Chlorine	"		50	100		200		400	

Calculated on basis of 2,000,000 pounds of surface soil per acre.

Magnesium (1) by para nitrobenzene azoresorcinol test.
Magnesium (2) by Titan yellow test.

Results of Soil Tests
Agronomy (Soils) Dept. University of Maryland

Date
Per

Lab. No.	Name and address of Sender	Field Sample	Soil Series: Type	pH	Lime Tests			Soluble Constituents							
					Comber	Ca	Mg	Phos.	K_2O	NO_3	NH_3	Mn	Al	Cl	Obs. O. M.

pH - Method of expressing the degree of acidity found. pH 7.0 - Neutrality. Lower figures indicate acidity. For example, pH 6.5 - slight acidity. pH 5.5 - moderate acidity. Figures above pH 7.0 indicate that the soil is alkaline or sweet.

Comber - This refers to the comber or thiocyanate test for soils in which the result is given in pounds of lime per acre, in terms of pulverized lime stone. An equivalent amount of hydrated lime is two thirds and for burned or lump lime is one half as much.

The soluble constituents for which tests are made: Calcium - Ca. Magnesium - Mg. Phosphorus - Phos.(P_2O_5).Potash K_2O Nitrate Nitrogen NO_3. Ammonia - NH_3. Manganese - Mn. Aluminum - Al. Chlorine - Cl. Observed Organic Matter Obs. O.M. These constituents are reported as V. H. - very high. H - high. M - Medium. L - Low. T - trace. O - None found. A plus sign means a little more, a minus sign a little less. Note that these refer to soluble constituents, not the total amount of any constituent in the soil. Only soluble plant foods are available for crops.